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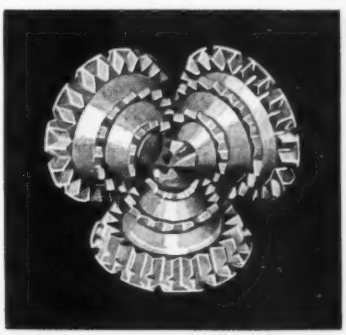
# the OIL AND GAS JOURNAL


## Why we drill "dry holes"

**THIS SPECIAL ROTARY RIG** isn't intended to produce anything but "dry holes." It is an important part of our research equipment for testing new rock-bit designs. With it we can simulate field-drilling practices encountered in any part of the world.

This equipment enables us to produce the effects of drilling at depths of over 20,000 feet, loads of over 100,000 pounds, and angles up to 10 degrees. Variable rotary speeds are available up to 400 rpm. Special instruments translate the forces applied. This careful research pays off in the field by enabling us to predict how one of our bit designs will work in a particular formation. Trial and error in the field is reduced to a minimum.

This is another example of the intensive research program—started in 1911—which Hughes Tool Company conducts in a never-ending effort to design more efficient rock bits. Rock bits that will enable the drilling industry to "make more hole faster."



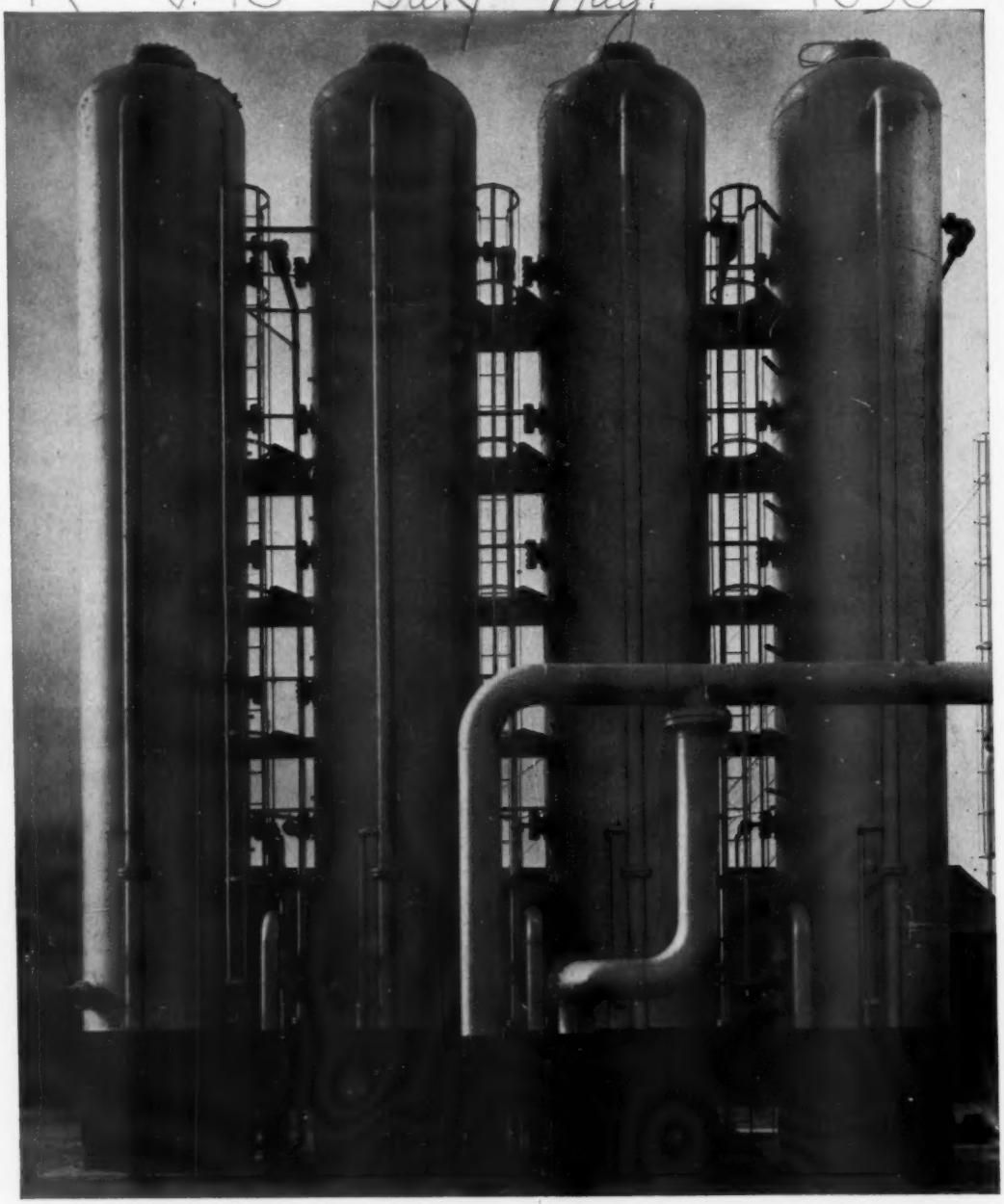
HUGHES
TOOL COMPANY
HOUSTON, TEXAS

*Hughes Rock Bits—World Standard of the Industry*


**PRICE 50 CENTS** TABLE OF CONTENTS PAGE 17 **JULY 6, 1950**

XUM

R v.49² July - Aug. 1950



**ABSORBERS FOR WEST TEXAS**

•

Efficient and low-cost operation assured through proper design and precision fabrication from quality materials.

•

**WYATT METAL & BOILER WORKS**

Wyatt's

HOUSTON - DALLAS

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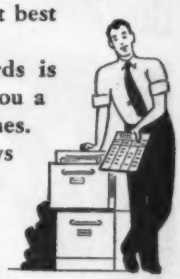
# This man knows what his wire rope costs him

He's quit guessing. Now he knows what his wire rope *actually* costs. He learned long ago that purchase price alone doesn't tell him a thing. So he devised a simple system of records—records that show the amount of work his ropes do, and their cost per unit of work.

This is something that Bethlehem has always recommended. To get a true picture of rope costs—an accurate picture—you should have figures showing the cost per ton-mile, yard of rock moved, or other unit that best applies to your business.



The keeping of such records is good, sound practice. Gives you a chance to compare rope values. That we like—for we're always ready to stack the Bethlehem product against all comers. You'll be, too—when you use this rope consistently.

LET YOUR RECORDS TELL YOU!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*Export Distributor:* Bethlehem Steel Export Corporation

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910, at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1950.

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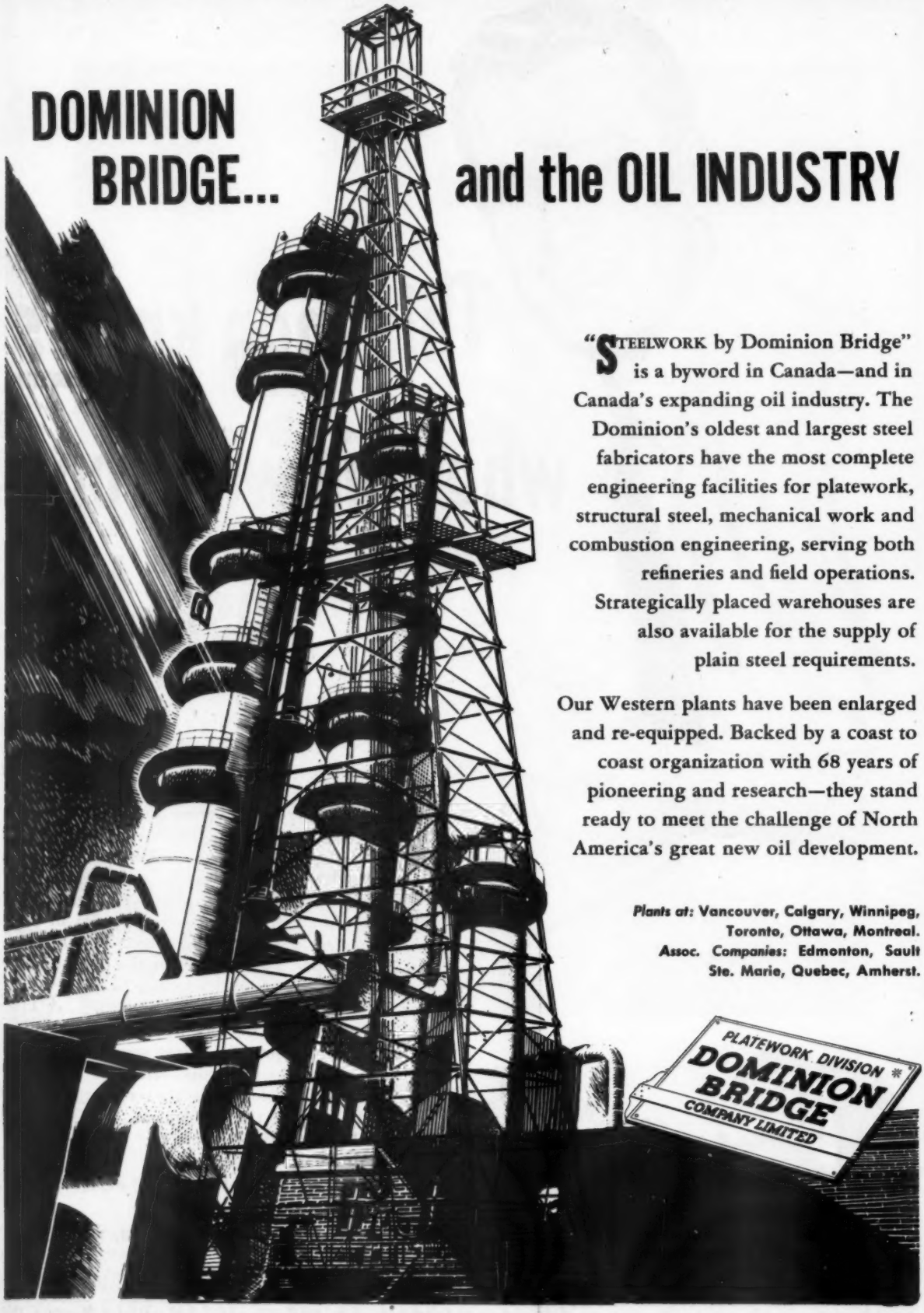
# DOMINION BRIDGE... and the OIL INDUSTRY




"STEELWORK by Dominion Bridge" is a byword in Canada—and in Canada's expanding oil industry. The Dominion's oldest and largest steel fabricators have the most complete engineering facilities for platework, structural steel, mechanical work and combustion engineering, serving both refineries and field operations. Strategically placed warehouses are also available for the supply of plain steel requirements.

Our Western plants have been enlarged and re-equipped. Backed by a coast to coast organization with 68 years of pioneering and research—they stand ready to meet the challenge of North America's great new oil development.

*Plants at:* Vancouver, Calgary, Winnipeg, Toronto, Ottawa, Montreal.
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*Research keeps* **B.F.Goodrich** *first in rubber*

# "X-ray" of a grommet V belt— the belt that lasts 20 to 50% longer

## *Twin grommets found only in B. F. Goodrich V belts*

YOU have to look inside a V belt to to see what gives you more belt service for your money. BFG engineers developed this "X-ray" demonstrator to show you the B. F. Goodrich grommet construction. A "belt" was made of a transparent, flexible material just so you can see the grommets.

***Note the twin grommets***—The two endless loops are grommets, the load-carrying section of the B. F. Goodrich grommet V belt. They're not ordinary cables, but are made by winding heavy cord on itself to make them endless.

***All cords work***—Placed close to the driving faces of the belt, grommets keep working close to the driving surfaces. This concentrates cord strength, all cords work, no cords overwork, the load is evenly distributed. In laboratory tests, B. F. Goodrich grommet V belts actually lasted 20 to 50% longer.

***Greater flexibility***—Twin grommets float in a bed of solid rubber. No plies of fabric, every part of the belt is equally flexible. Better grip, less slip. Size for size, grommet V belts give ⅓ more gripping power, pull heavier loads with a higher safety factor.

***Reduce belt failures***—Most cord failures occur where cords overlap. But with an *endless* cord section in the grommet V belt, the cause of failures is eliminated.

***No other V belt is a grommet V belt***—The twin grommets are found only in V belts by B. F. Goodrich (U. S. Patent No. 2,233,294). It's a premium construction that costs you no more. D and E sections only.

See how the cause of most belt failures has been eliminated. Call your local BFG distributor. He has an "X-ray" demonstrator belt and will be glad to bring it around. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

*Grommet V Belts* BY

**B.F.Goodrich**

# "Oilwell" Swivels get New Names

## LEGRAM

TO: MR. DRILLER--"OILWELL" REMOVES MYSTERY FROM SWIVEL RATINGS. SAME DEPENDABLE SWIVELS ARE NOW DESIGNATED TO GIVE TONNAGE RATINGS AT A GLANCE. CORRECT SWIVEL CAN NOW BE SELECTED WITH MINIMUM CHANCE OF ERROR.

"OILWELL" Swivels are designed in four sizes so that you can select the proper size to meet your drilling requirements without paying for unnecessary capacity. Regardless of size, all "Oilwell" Swivels embody field-proved design principles which result in outstanding performance and low maintenance.

"Oilwell" is renaming its complete line so that you can tell at a glance both the TONNAGE RATING and the TOOL-JOINT PIN SIZE involved. Using the former 300-D Swivel as an example, the new designation was derived in this manner:

| Swivel | 6" Tool-Joint Pin | 400 tons Dead-Load Capacity |
|---|---|---|
| S | 6 | 400 |

| New Designation | S4-100 | S5-200 | S6-300 | S6-400 |
|---|---|---|---|---|
| Old Designation | 60-C | 100-C | 150-C | 300-D |

STUDY THE SWIVEL RATING CHART (above) which shows recommended drilling depth, dead-load capacity in pounds and other important data for each swivel size.

*"Oilwell" representatives will be glad to help you make a thorough analysis of your operating conditions and select the swivel indicated to meet your drilling requirements.*

**OIL WELL SUPPLY COMPANY**

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USS "OILWELL"

UNITED STATES STEEL

230 universities, educational institutions

147 hospitals and other medical groups

1,825 small and large businesses

219 churches, religious organizations

3,500 Standard of California employees

91,000 Americans who invested their savings

# Who shares Standard of California Profits?

No college football stadium in the country could seat all the owners of Standard of California.

With 97,000 individual stockholders, it's one of the most widely owned companies in the West . . . and more than 70% of these people are small stockholders with less than 100 shares.

Among the large stockholders, you'll find literally hundreds of companies and organizations which work for you or benefit you every day—hospitals, universities, museums, churches, insurance companies, YMCA groups, research laboratories. And, of course, thousands of our employees are also owners. Standard of California profits, therefore, are divided among a tremendous number of people.

You share, too. Just since the war we've invested more than $500,000,000 in oil wells, refinery units, pipelines, tankers, distribution plants and marketing outlets...facilities to help us meet our responsibilities to serve the growing West.

STANDARD OIL COMPANY
OF CALIFORNIA
plans ahead to serve you better

**High pull-out strength of J&L Shot Hole Casing means greater recovery—less cost—on Seismograph work.**

Shot Hole Casing doesn't have to take such a large slice of your budget any more. Nor does it have to be heavy and cumbersome, hard to make-up and break-out.

Take a look at J&L Shot Hole Casing. It's made of controlled quality steel for lightness and flawless strength. The Integral Joint eliminates separate couplings. Average joint pull-out strength is 15,000 lbs. Can be recovered and used over and over. You buy LESS casing.

The lightness—2.037 lbs. per foot—means J&L casing is more easily handled by the crew. Also the coarse square threads permit easy stabbing and quick make-up.

Another big advantage is availability. Stocks are kept at many of our stores so that prompt delivery can be made on telephone instructions. This source of supply is designed to fit the movement of your crews. Keeps the work up—wasted time down.

Call your Jones & Laughlin Supply store the very next time you need shot hole casing.

3" OD, 16 gauge J&L controlled quality steel. Available in 4" OD. Tubing is electrically welded.

Cold rolled coarse square threads, 4 per inch. Full wall thickness and strength maintained.

Average joint pull-out strength is 15,000 lbs.—plenty of strength for maximum recovery under normal conditions.

Tubing has plenty of strength, yet is light in weight for easy handling! 16 gauge, 2.037 lbs. per ft., convenient lengths.

Integral joint eliminates independent couplings—saves time in making-up or breaking-out.

All these stores plus our sales offices are ready to assist you with prompt deliveries regardless of the movements of your crews.

79 stores for your convenience!

"... here's MY warehouse!"

Jones & Laughlin Supply Company

J&L STEEL

Subsidiary of
Jones & Laughlin Steel Corporation

TULSA, OKLAHOMA




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# MODERATELY PRICED SMALL STEEL VALVES FROM THE COMPLETE CRANE LINE

## UNION BONNET GATES . . . MORE COMPACT, MORE RUGGED

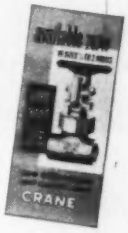
Here's a valve value made possible by Crane Co.'s finer facilities for *quality* mass production. These low-cost, small steel gates are specially designed for a wide range of tough services in petroleum processing, in oil and gas fields. They readily withstand rough usage, piping and pressure strains, and extreme variations in temperature. The features below show how and why they do it.

**COMPACT OVERALL DESIGN**—size for size, these valves are more compact than the usual high-pressure design—at no sacrifice of strength.

**TIGHT UNION BONNET JOINT**—heavy steel union ring with long, precision-cut threads pulls up easily, stays tight, protects against distortion when joint is opened. Male and female bonnet joint with soft iron gasket eliminates possibility of gasket blowout.

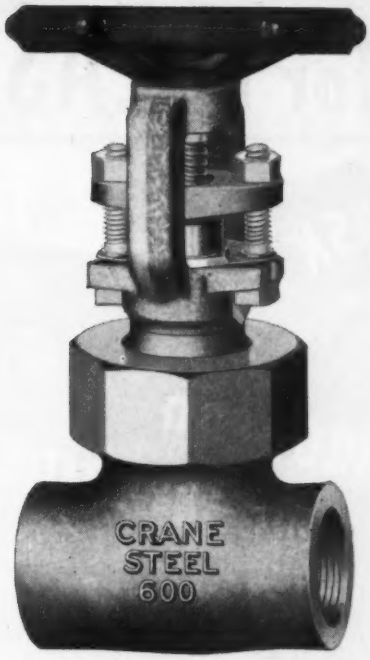
**LEAKPROOF BODY SEAT RINGS**—are securely rolled into the body. No danger of leakage around ring. Cannot loosen in service.

**FULLY GUIDED SOLID WEDGE DISC**—cannot get out of line or jam in body. Disc drag and wear on seating surfaces are minimized.

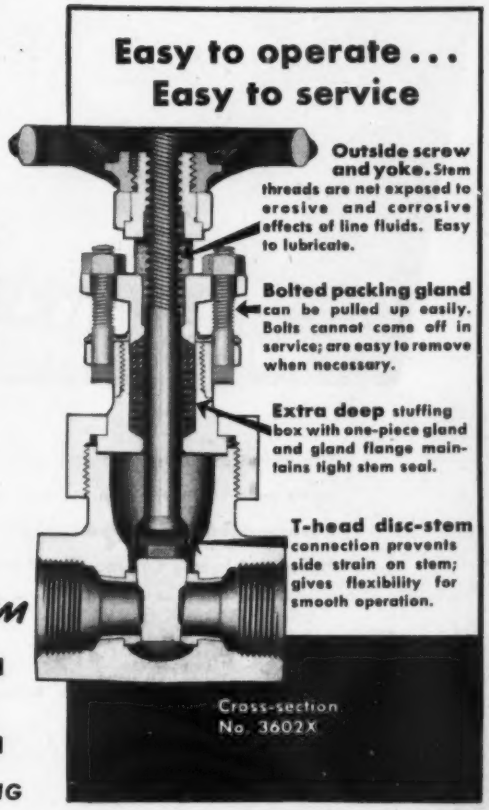



**GET DESCRIPTIVE FOLDER AD-1741** for more data on these valves. Gives sizes, dimensions, and service recommendations. Ask your Crane Representative for a copy or write direct. These valves also listed in your Crane No. 49 Catalog, P. 223.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
*Branches and Wholesalers Serving All Industrial Areas*




**No. 3602X, 600-Pound Small Steel Gate for oil or oil vapor up to 1000° F. Exelloy to Exelloy seating. Sizes: ¼ to 2-inch. Screwed or welding ends.**


Easy to operate . . .
Easy to service
Outside screw and yoke. Stem threads are not exposed to erosive and corrosive effects of line fluids. Easy to lubricate.
Bolted packing gland can be pulled up easily. Bolts cannot come off in service; are easy to remove when necessary.
Extra deep stuffing box with one-piece gland and gland flange maintains tight stem seal.
T-head disc-stem connection prevents side strain on stem; gives flexibility for smooth operation.
Cross-section No. 3602X

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Simplify and Improve Design
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Better Fabrication
•
Reduce the Cost

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MODERN PIPE WELDING PRACTICES

BY F. C. FANTZ

BULLETIN 49-A

MIDWEST PIPING & SUPPLY CO., INC.
ST. LOUIS – NEW YORK – BOSTON – LOS ANGELES – CHICAGO

of Piping Systems

**This technical bulletin is a study of ways and means of using welding for the improvement of piping systems. It was written by F. C. Fantz, Vice President, Midwest Piping and Supply Co., Inc., out of many years' experience with welding as applied to all kinds of piping. He has described in detail and illustrated a number of practical, tested methods of obtaining better piping assemblies. Here is a 16-page bulletin full of workable, proven ideas that will be helpful to anyone interested in modern piping systems. Use the coupon below or ask the nearest Midwest plant or office for a copy.**

**Midwest Piping & Supply Co., Inc.**
**1450 So. Second St., St. Louis 4, Mo.**

Please send me (without obligation) Bulletin 49-A, "Modern Pipe Welding Practices."

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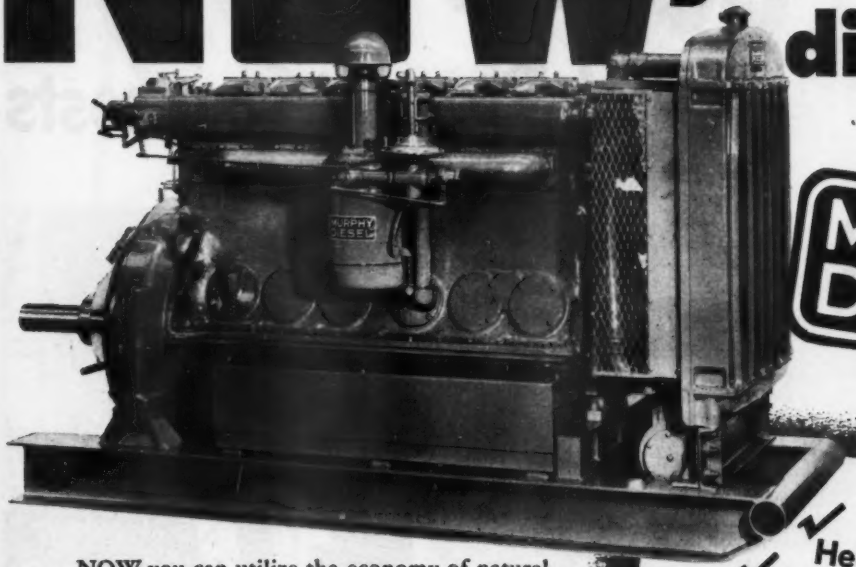
# NOW... a Dual-Fuel Engine that's different



MURPHY DIESEL

- Heavy duty design
- Economy of operation
- Long Engine life
- Instant fuel changeover
- Ease of operation
- Full power on either fuel without additional parts

NOW you can utilize the economy of natural gas as fuel in a rugged, heavy duty engine that's built to give long, dependable service. Unlike ordinary gas engines or gas conversion engines, the Murphy combines heavy duty construction with high compression combustion to provide new highs in durability and economy of operation.

In operation, the engine is started and warmed on diesel fuel. Its operation on either diesel fuel or natural gas is instantly selective by properly positioning a simple hand lever for the desired fuel. On either fuel no further adjustments are necessary. If operation as a full diesel is desired for continuous diesel service, the change can be made quickly without any additional parts.

Get full details from your Murphy Diesel Dealer and ask for the bulletin described at the right.

*Bulletin 107 gives design and operating details of Murphy Dual-Fuel Engines. Ask for your copy today*

**MURPHY DIESEL COMPANY**
**5305 W. Burnham St., Milwaukee 14, Wisconsin**

*Manufacturers of Dual-Fuel Engines, 135 to 180 H.P.; Diesel Engines, 90 to 220 H.P.; Generator Sets, 60 to 133 K.W.; also Crude Oil Engines and Mech-Elec Units.*

***See Your Nearest Murphy Diesel Dealer for Complete Information:***

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**HOUSTON, TEXAS**
Houston Engine & Pump Co., Inc.

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# DODGE TRUCKS

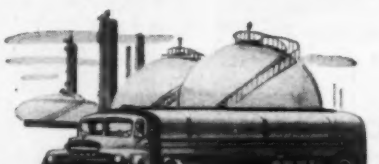
## are "Job-Rated" to cut costs

There's a Dodge *"Job-Rated"* truck for practically any oil field and refinery hauling job.

When you get a Dodge truck, it is *"Job-Rated"* —with all units from engine to rear axle engineered and sized for your particular job. You get power to spare . . . with maximum gas and oil economy. Why not find out how a Dodge *"Job-Rated"* truck can cut costs in your oil field or refinery operation?

See your Dodge dealer. He'll offer you a good deal and show you why a Dodge *"Job-Rated"* truck is the pet truck for "pet" products.

Dodge builds *"Job-Rated"* stakes with G.V.W. capacities from 5,800 to 17,750 lbs. Drivers like the short wheelbase maneuverability; the "Pilot-House" cabs, with the "Air-O-Ride" cushioned comfort of their "knee-level" seats.



Your dealer has husky tractors like the one above in 1½- to 4-ton sizes. He can supply you with special tank bodies on *"Job-Rated"* chassis. 4-ton models feature 377 cu. in. engine with twin carburetion, and many other features.

Dodge *"Job-Rated"* pick-ups in ½-, ¾- and 1-ton sizes are available with gyrol Fluid Drive for greater smoothness, longer life. Only Dodge builds *"Job-Rated"* trucks. See your Dodge dealer for a good deal . . . all ways!

With all their extra value **DODGE** *"Job-Rated"* **TRUCKS** are priced with the lowest

# Specify Thermoid

## Mud-Flo Suction Hose

Permits raising and lowering of suction pipe and changing the position of intake without changing connections.

**Tube**—3/16" thick, oil-resistant, bonded to strong, open-weave breaker fabric.

**Reinforcement**—heavy galvanized round wire embedded in compound prevents collapse . . . gives maximum flexibility . . . adsorbs vibration and permits unobstructed flow. Strong, heavy, square woven duck plies.

**Cover**—oil-resistant . . . withstands severe abrasion and weathering.

Furnished with built-in grooved nipples.

## Flexible Discharge Hose

Speeds rig-up and tear-down time between mud-pump and standpipe. Eliminates vibration that causes loosened connections and avoids sharp angles that cause pressure loss and turbulence.

**Tube**—Synthetic rubber . . . abrasion and oil resistant . . . free circulation and long life assured.

**Reinforcement**—Steel Cables and prestretched fabric for the greatest strength and flexibility.

**Cover**—Special vulcanized compound resists aging and abrasion.

**Couplings**—Streamlined steel . . . full flow built-in and anchored securely for the life of the hose.

It will pay you to *Specify* **Thermoid!**

*Also* First Choice Thermoid Powerflex Rotary Hose

***The recognized leader in the field. Every length pre-tested to 5000 psi before shipment.***

*Thermoid Quality Oil Field Products: Oil Country Flat Beltings • Wire Line Turn Backs • No-Wip Line Savers • Stuffing Box Rings • All Types of Hose • Molded Specialties • Powerflex Rotary Hose • Mud-Flo Slush Pump Hose • Flexible Discharge Units • Brake Blocks • F.H.P. and Multiple V-Belts.*

SEE OUR CATALOG IN THE COMPOSITE CATALOG

**Thermoid Company**

**Western Offices and Factory • Nephi, Utah, U.S.A.**

Main Offices and Factory • Trenton, N. J., U. S. A.

*Industrial Rubber Products • Friction Materials • Oil Field Products*



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# They Say—

### It Deserves Better

"The petroleum industry has served the welfare of the nation in a way that should compel the confidence and admiration of the American people. Only a few years ago our industry achieved a war record which entitles it to the eternal gratitude of all America. Since then it has met and conquered the most stupendous problems of production and supply. The petroleum industry has never failed the American people. It has never fallen short of the demands made upon it—as the keystone of our national defense in war, as the mainspring of our expanding economy in peace.

"Why, then, is the petroleum industry sometimes subjected to undeserved criticism?

"First, because the petroleum industry is one of the principal targets of those who would undermine and destroy our private-enterprise system. It is their objective to regiment the petroleum and other basic industries, with the ultimate goal of controlling and regulating all phases of our economic system. . . . The second reason can be traced to the modesty and disregard of gossip which are characteristic of our industry."

*Baird H. Markham, director, American Petroleum Industries Committee, speaking in New York.*

*Shell News, Shell Oil Co.*

### Government 18, Stockholder 5

"In 1949 federal, state, and city taxes took 18¾ per cent of the total income of the company (Union Oil Co. of California). In other words, out of every dollar in sales, 18¾ cents had to be used to pay taxes.

"Stockholders, the real owners of the business . . . received only 5 cents per dollar of sales.

"The employes of the company did almost three times as well as the stockholders, but still had to take a back seat to the tax collector. The employes received 14 cents per dollar of sales.

"Could anything be more absurd or, for that matter, any more dangerous to our free enterprise system and our American way of life than for taxes to take almost exactly the same amount from the total revenue of the company as is paid the stockholders and employes?"

*Pulling Together, National Small Business Men's Association.*

### Research Teamwork

"A good research team is quite likely to have a definite 'personality,' just as an individual has. Personality results when the group adopts an agreeable pattern for carrying out its work, an effective method for dividing up the job to be done, and an almost unconscious habit of supporting each other.

"In a research organization, no matter how small, men draw strength from each other. Their ideas spark, the sum total of their thinking is greater than the component parts. This process takes place not only within the group but between members of the group and other men in the laboratory. The synergistic effect which results from the effective interchange of ideas in


**Eagle-Picher Lead Wool**

**STOPS**

***bottom water***

Rule out the risk of oil-wasting bottom water shutdown by tamping Eagle-Picher Lead Wool in the hole. The finely stranded, flexible metallic wool makes a water-tight plug that seals every crack and crevice. Comes in convenient 50-pound sacks—easy to place in special cartridge-shaped Eagle-Picher Wire Containers sized to fit all casings. Order through your jobber.

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***These 3 Eagle-Picher Bearing Metals meet most requirements***

1. **Dreadnaught**
   — for extreme speed and heavy-duty conditions.
2. **Outlasta**
   — for medium speed and average-load conditions.
3. **Durable**
   — for low speed and light-duty conditions.

a well-administered research laboratory is one of the marvels of our day and one of the important sources of industrial strength.

"Perhaps a successful research team should not be broken up. It may be well to give greater emphasis in research administration to group compensation in bonus or salary rather than in the promotion of individuals."

*Charles Allen Thomas, executive vice president, Monsanto Chemical Co., addressing technical conference of Standard Oil Co. (Ind.)*

### Dangerous Motor Age?

"In 1909, the peak year for travel by horse power, there were some 26 million horses and mules at work, traveling 13 billion miles annually. Thus Dobbin averaged 500 miles per year compared to today's motor vehicle which clocks approximately 9,800 miles each year. In 1909, there were 3,850 persons killed in accidents involving horses and horsedrawn vehicles—30 for every 100 million horsedrawn miles. The current fatality rate for gasoline-powered vehicles is seven deaths for each 100 million miles traveled. And some people call the gasoline age dangerous!

*Petroleum Newsnotes, American Petroleum Institute.*

### Increasing Gas Sales

"Our present anticipation is that this year our heating business will increase by about 70,000 or 75,000 accounts throughout the system, and that as near as we can tell now, that growth promises to continue for a number of years.

"As you know, it is due to a large extent to a differential in price which is so favorable for gas when compared with fuel oil, and also that it is favorable under most delivery conditions when compared with coal, since the supply of coal depends, first, upon the ability of the miners to get it out, and, secondly, upon the railroads to transport it. . . ."

*F. H. Lerch, Jr., president, Consolidated Natural Gas Co., addressing annual stockholders meeting.*

### Price Defense

"Except for a decimal increase in the wholesale price of gasoline on January 6, 1948, on account of increased freight costs, there has been no increase in the gasoline price in lower Michigan since December 15, 1947.

"Meanwhile, our company has made six improvements in White Crown quality and five in Red Crown quality to meet public demand in lower Michigan. Betterments in quality of product have cost millions of dollars and have put motorists in position to effect economies in operation and improved performance of their cars, especially to make it possible for them to operate the newer high-compression engines. In the same period the company has had to meet heavy expenses incurred in connection with three-quarter-billion-dollar capital expenditure made in the postwar period to provide additional facilities to assure sufficient supplies of petroleum products.

"In the free market, advancing demand and advancing costs inevitably cause price advances sooner or later. In Michigan it has been later. Demand for gasoline has increased nation-wide by 13.6 per cent since the last Michigan gasoline-price increase.

"Compared to most of the things people buy, gasoline is still cheap, because of advances in consumer purchasing power. The typical purchaser today can buy more gasoline with an hour's pay than he could before the war.

"Two years ago Michigan purchasers were worried by inability to get all the petroleum products they wanted. It has cost something to assure them abundant supply, but we believe they would rather pay a few cents more and have abundance than have old price level and not enough."

*Statement of Standard Oil Co. (Ind.) in answer to Senate resolution proposing investigation of gasoline-price increase in Michigan.*

Call us for steel

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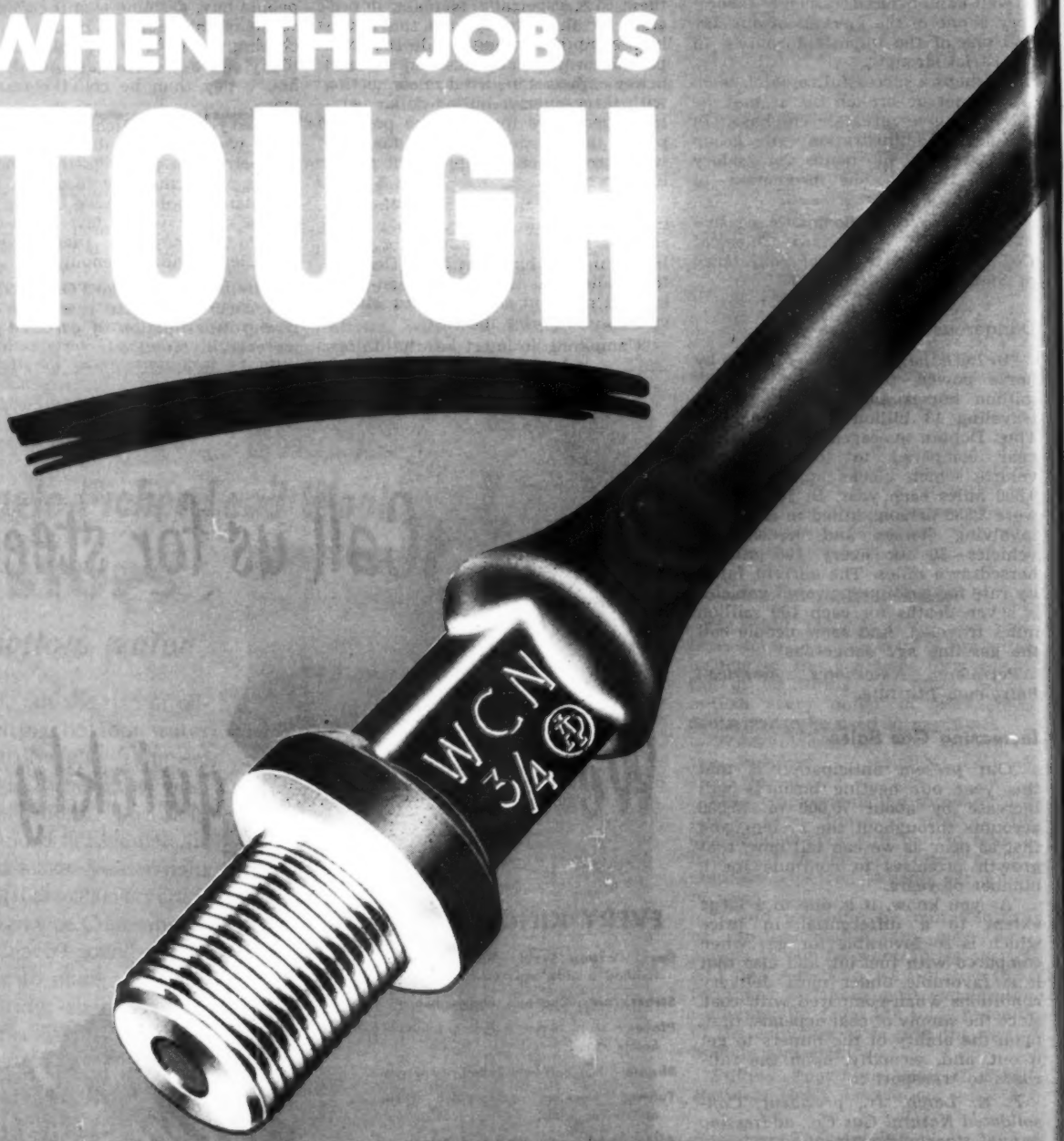


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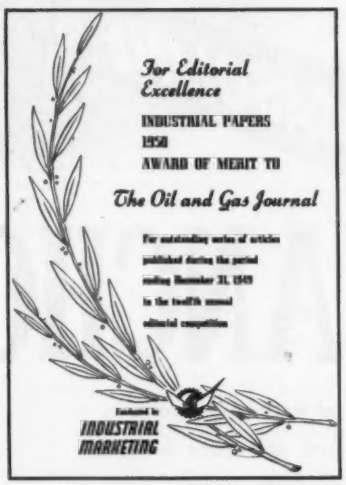
# JOURNALLY Speaking

## Series Winner

"AWARD of Merit to Oil and Gas Journal for outstanding series of articles published during 1949" reads the plaque which went up on our editors' walls this week and is reproduced in this column.




It was awarded by Industrial Marketing magazine, which annually holds a judging of the editorial work of just about all the business publications of the country. It's quite an honor to win one of these plaques, as there are dozens of entries in each of the various categories such as best single article, best graphic presentation, and similar aspects of the journalistic trade.

Our series winner was "Cost-imating," by W. L. Nelson, the Journal's technical editor. An installment of this series ran in every issue during 1949, and it has since been reprinted as a handbook.

Unless you were a refinery man or particularly interested in plant construction and equipment costs, a single installment of this series might not have meant much to you. But when the series was completed it looked pretty impressive. Here's why:

"Cost-imating" gave engineers and executives a rapid but accurate means of estimating the cost of a new plant or process unit. Costs have been fluctuating since the war, and until we printed this series there was no comprehensive and concise source of this information. Use of the tables and indexes in "Cost-imating" saves hundreds of dollars in estimating costs and in deciding which type of process equipment is most economical.

"Doc" Nelson knew exactly what was wanted because, as a consulting engineer and former estimator for an engineering contractor, he has had to make many such estimates and had devised his own shortcuts. This series was the essence of files he had built up during his professional lifetime.

Another gimmick that made the series so useful was Nelson's index of basic price changes, which the Journal now runs every month. This keeps the series up to date, and makes "Cost-imating" a current handbook to keep in the top drawer of the desk.

And hundreds of our readers do just that, as proved by the stack of congratulatory letters and requests for reprints.

So we were all pretty tickled when the judges, none of whom is engaged in estimating refinery costs, saw the merit in Nelson's series.

Congratulations, Doc. You take the credit and we'll keep the plaque.

## Top Man Wins

ARE you one of those unfortunates who has to read our favorite oil publication after somebody else has had a crack at it? If so, you probably never even got a look at the swell map of Gulf Coast oil which was inserted into each copy of our issue of June 22, because the top man on the routine slip undoubtedly filched it for his own use.

That's too bad, but our Readers Service Department anticipated that this would happen and laid in a supply of extra copies which it will part with for a dollar fifty a throw. And for just twice that modest sum you can have your own personal subscription so things like that won't happen again.

*—Henry D. Ralph.*



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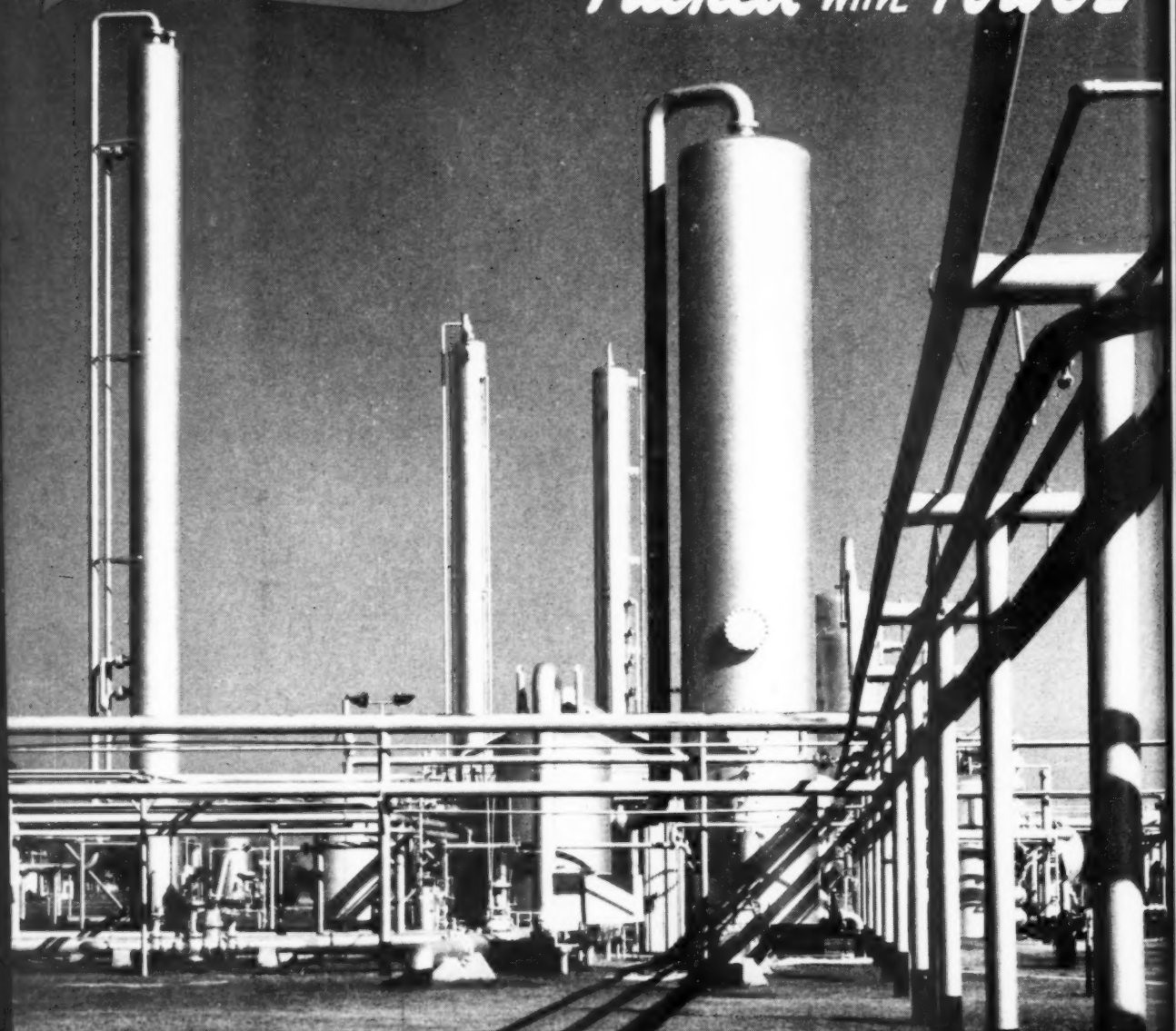

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# What About Oil?

The possibility that the Korean crisis may result in another world conflict is bringing analyses of petroleum positions by international observers. Everywhere it is recognized that oil in World War III would have an even more important bearing than in its two predecessors.

It is true, as is being pointed out, that whereas in 1939, at the start of World War II, the Western Hemisphere had 77 per cent of the world's crude-oil output, this percentage decreased to 64 last year. While the Western Hemisphere's oil output for the 1939-1949 decade increased 55 per cent, including a 45 per cent gain in this country, the Eastern Hemisphere expanded 192 per cent.

Along with these supposedly highly significant data the commentators conclude that Russia, in a surprise attack, could quickly secure control of the oil properties of the Middle East where practically all the gain of the Eastern Hemisphere originates. It is then assumed that these oil facilities would support Russia's war program so that in carrying on a world conflict she would not be confronted with a basic weakness in oil.

Even a superficial study of the Middle East oil situation will reveal flaws in the statements of these alarmists.

In the first place, today's war preparations include plans to render oil properties inoperative should it not be possible to defend them. Furthermore, in the case of the Middle East, the problems of Russia, should she acquire all the facilities, would not be solved oilwise. Most of the oil production fronts on the Persian Gulf and could only be made useful to Russia, in large quantities, through long-distance water transportation. In the case of northern Iraq, substantial supplies from the large Kirkuk field are available only by pipe line with terminals on the eastern Mediterranean.

Experts have pointed out that Eastern Hemisphere oil supplies are vulnerable military-wise, regardless of who holds them. Advances in bombing technique, directed from bases several hundred or several thousand miles away, could make refineries, water terminals, pipe-line stations, and all concentrations of petroleum completely inoperative.

The petroleum strength of this country and Canada, and to some extent other parts of the Western Hemisphere, lies in the fact that the crude oil is obtained from a large number of fields, connected to scattered refineries by a vast network of pipe lines and waterways. This decentralization of petroleum, in contrast to conditions elsewhere, will be this country's most important protection should another emergency arise.

The United States has not lost its controlling position in oil. As in the past, its abundance will be this country's greatest asset in another global conflict and its lack the greatest weakness of the enemy.

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# THIS WEEK

**INDUSTRY**—Esso Standard on July 5 announced a 10-cent increase for residual fuel oil on East Coast, bringing New York Harbor No. 6 barge price to $2.15. . . . ¶Increasing market for residual fuel in gas manufacture resulting from use of Hall process cited before Canadian Gas Association. . . . ¶New company asks FPC for permission to construct world's longest pipe line, to carry gas from Gulf Coast fields to Pacific Northwest. . . . ¶Oil industry established new safety record in 1949, A.P.I. discloses.

**ACTIVITY**—A total of 911 wells were completed during week ended July 1, up 101 wells from previous week and 81 wells from same week last year. . . . Wildcat completions totaled 179 for the week compared with 153 for previous week. . . . Crude production averaged 5,369,775 bbl. daily, an increase of 78,775 bbl. daily. . . . Rotary rigs operating in United States are at the highest level since end of 1948, totaling 2,230 rigs on June 26. . . .

**TRENDS**—Operators completed 4,221 wells in 5-week period ended July 1, an increase of 7.4 per cent over same period last year. . . . Footage was up 9.8 per cent. . . . Oil-well completions totaled 2,327 wells, a gain of 10.4 per cent over same weeks in 1949. . . . Total wildcat completions increased 11.5 per cent for the same periods. . . .

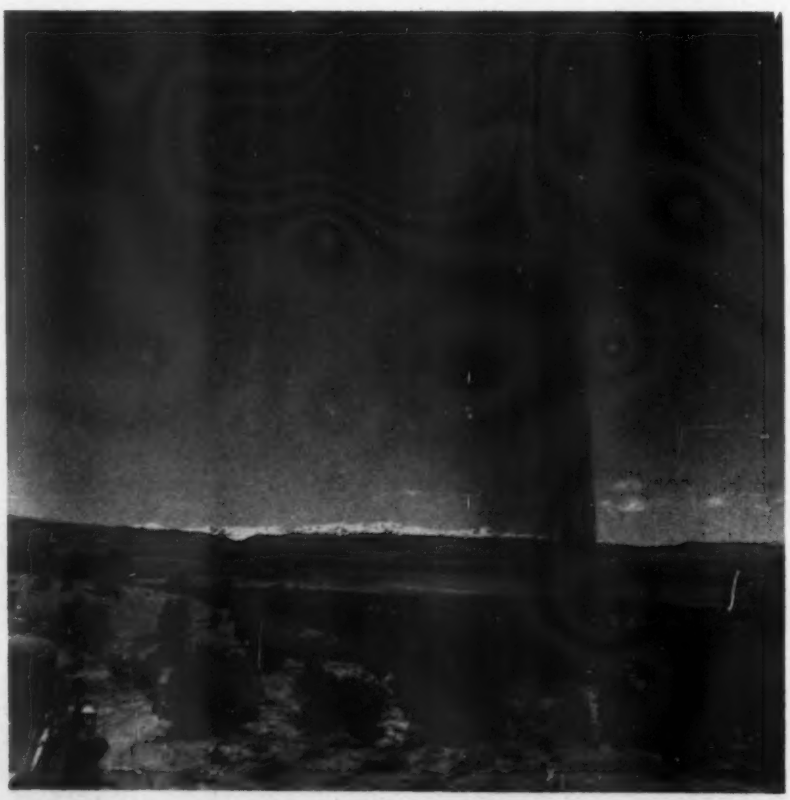
**INTERNATIONAL**—First refinery in Spain goes on stream. . . . Eventually will process 20,000 bbl. daily. . . . ¶Anglo-Iranian, Israeli officials agree upon reopening of 83,000-bbl. Haifa refinery after 2-year shutdown. . . . Plant to handle about 20,000 bbl. daily of crude from undisclosed source. . . . ¶Growing demand, high imports, additions to stocks cited as factors in large increases in foreign crude-oil production. . . . ¶Standard-Vacuum, Caltex, and Shell remove staffs from Korea. . . .

**PIPE LINES**—Tuscarora Oil Co., Esso Standard affiliate, will treble capacity of its 360-mile products pipe-line system between Linden, N. J., and Pittsburgh. . . . Present line is being replaced with 10 and 12-in. pipe. . . . ¶Michigan-Wisconsin Pipe Line Co.'s Texas-to-Michigan natural-gas pipe line will be enlarged to nearly double present annual sales capacity. . . . FPC gives temporary authorization for new facilities. . . . Michigan Consolidated Gas Co. also will expand in connection with Michigan-Wisconsin's program. . . .

**REFINING**—Sinclair Refining acquires 30,000-bbl. refinery of Wood River at Hartford, Ill., bringing number of Sinclair plants to seven. . . . Two catalyst manufacturers to expand production to meet increasing demands. . . . ¶Texaco signs contract with Oil Workers International Union (C.I.O.) covering employes in New York. . . . Strike situation of the company over the country remains unchanged. . . .

**NATURAL GAS**—Shell Oil Co. and Canadian Western Natural Gas Co. complete agreement for Shell to furnish Canadian gas to the latter firm for distribution in Calgary. . . . Contract calls for up to 20,000,000 cu. ft. daily over the next 10 years. . . .

**GOVERNMENT**—Immediate war controls not expected, but plans for industrial mobilization ready. . . . ¶Neely report on imports delayed. . . . Effect of Korean situation, Mexican treaty abrogation subject of speculation. . . . ¶West Coast court holds California well-spacing law unconstitutional. . . . Appeal expected. . . . ¶Bill to encourage coal industry to enter synthetic-fuels manufacture introduced in Congress. . . . ¶Tidelands decision results in bill to require majority vote of Supreme Court in cases of original jurisdiction. . . .



*ACTIVE AREA.—Hottest spot in the Rockies at the moment is the Uinta basin in northeastern Utah, a desolate area which the Mormons said was good for nothing except to hold the world together. Several discoveries during the past 2 years have sent geophysical crews swarming over the basin this summer. This shows a Carter seismic crew in action and illustrates the mountainous nature of the terrain.*

# Middle East Picture

## Huge reserves, importance of transportation, competition between companies are chief impressions left with visitor

**Paul Reed**

**Paul Reed, the Journal's pipeline editor, has just returned from a 30-day trip in the principal oil countries of the Middle East. A series of articles on details of various operating practices in that area will appear in The Oil and Gas Journal over the next several weeks. This first article is of a general nature and gives some general impressions of conditions and activity in several Middle East countries.**

**Reed had unusual opportunities to visit oil operations seldom seen by outsiders. For instance, he was the only noncompany man to travel the entire length of Tapline, and the only American to traverse the new Anglo-Iranian big-inch crude line from Agha Jari to Mashur.**

A FLYING visit to the principal oil operations of the Middle East leaves one with some very definite impressions of these operations and their importance in the petroleum economy of the world.

First is the enormous size of the crude reserves. Precise figures may be lacking, but the conclusion is obvious at a glance. The huge individual production of widely spaced wells, the thickness of the pay zones, and the large number of semiproven and known but unexplored structures are ample evidence that here are reserves to supply a large part of the world for generations.

Second is the importance of transportation. This production is remote from consuming centers, but the first of the monster postwar pipe lines will be delivering crude to Europe's back door on the Eastern Mediterranean this winter; the second will be under construction shortly. This will greatly enhance the position of Middle East oil in the world's economy.

A third definite impression is the real competition among the five principal operators there, even though there is some interlocking ownership. In this country we are apt to think of Middle East oil as an entity, but in fact there is the keenest sort of rivalry for production and markets.

Another very obvious condition is the difficulty of operating in the Middle East. Cost of producing oil is low—so low as to chill the spines of American producers who dread the threat of imports. But other costs, unknown in this country, would seem to come close to offsetting this. Entire cities, ports, water systems, roads, and all other facilities must be built. Every single item of supply must be imported. All highly skilled and much semiskilled labor must be brought in from abroad.

**Few travelers.** — A visit by an outsider to the Middle East oil operations is a rare occurrence. There are no unsponsored travelers in this part of the world. Nearly all of them come on either diplomatic or oil-industry missions. Because of the geographic and political conditions of the region the sponsors assume quite a burden and responsibility in connection with the travels of a visitor.

Aside from the facilities operated by the oil companies themselves, the transportation and hotel accommodations are meager, to say the least.

So travel is almost impossible without the sponsorship of one of the oil companies. And the companies are so busy, and their facilities are so taxed by their own personnel, that they are not lavish with invitations. I was, therefore, aware that it was no inconsiderable tribute to the prestige of The Oil and Gas Journal that this trip was made.

The main object of this trip was to view first hand the peak in construction of Tapline. Already completion of certain stages of the work is resulting in the return of some personnel to the United States.

Tapline is the first of the huge crude-oil arteries so long in the planning stage. Also, it is, in itself, an outstanding engineering achievement of Trans-Arabian Pipe Line Co. and its president, Burt E. Hull.

The long trips totaling 2,000 miles to Saudi Arabian production and to all pipe-line construction projects in the Arabian desert, Trans-Jordan, Syria, and Lebanon were sponsored through the courtesy of Trans-Arabian Pipe Line Co. and Arabian American Oil Co. Trips of equal length through Bahrein, Iraq, Iran, and Kuwait were made through the hospitable arrangements of Bahrein Petroleum Co., Ltd., Iraq Petroleum Co., Ltd., Basra Petroleum Co., Ltd., Anglo-Iranian Oil Co., Ltd., and Kuwait Oil Co., Ltd.

Thanks to the airplane and the automobile I was able, in the short space of 30 days, to visit the principal producing fields and drilling and pipe-line operations of the Middle East, and to talk with the managers and engineers in charge of the varied undertakings. Detailed accounts, particularly of pipe lining and drilling programs, will follow in later articles, but first for some broad-stroke impressions.

**Reserves.**—No one knows the size of the crude reserves underlying this broad region, and those who have partial information are reluctant to translate their guesses into cold figures. During the war E. DeGolyer startled the world by estimating Middle East reserves as 32 billion barrels, but it now appears that this figure may prove to be conservative.

Very few of the fields discovered in the past 10 years have been fully defined. In some of them there are several pay zones which have not been thoroughly tested. The ultimate recovery by proper reservoir engineering is yet to be determined in the newer fields. Surface geology and seismic exploration have indicated the presence of numerous large structures as yet untapped by a drill.

To say that the potential crude reserves of the Middle East are enormous is an understatement, but in the absence of definite figures on proven reserves one can say only that there is no question but what this

*At his tent in the desert the Arab host breaks twigs to kindle fire in the sand for making tea when he was visited by Paul Reed last month during his Middle East tour.*

*The castle at Hafar al Batim in the background, which serves as base for the emir of the district, is the only permanent Arab structure of any kind seen for 800 miles. Elsewhere in this stretch the Arabs live in Bedouin tents. The Arab in the foreground, armed with a rifle, is dismounting to water his camel at a nearby well. The Arab in shirt and trousers at the rear of the group acted as guide for Reed to this oasis. He is employed at Tapline Station No. 3 at Qaisumah, 12 miles away.*

region is capable of powering the economy of most of the Eastern Hemisphere for as far into the future as man dares to plan.

**Transportation.**—The chief problem is getting this oil to market. The older fields of Iran and the postwar discoveries on the Arabian side of the Gulf of Persia are all close enough to tidewater to be served by relatively short pipe lines. This permitted the development of the world's largest refinery at Abadan and the newer refineries at Bahrein and Ras Tanura.

But the products markets in Africa and the Orient easily reached by water are insufficient to support the growing scale of crude production. The tanker haul around the Arabian Peninsula and through the Suez Canal to Europe is costly. European countries prefer to import crude rather than products, and to do their own refining.

All these factors built up the necessity for easier outlets for huge quantities of crude.

By November of this year Tapline should be delivering 300,000 bbl. of Arabian crude daily to the tanker terminal at Sidon, Lebanon, on the Eastern Mediterranean. By that date, also, construction should be under way on the new 30-in. crude line of Iraq Petroleum Co.

Since 1933 I.P.C. has been pipe lining crude from Kirkuk in central Iraq through a double 12-in. system to two Mediterranean ports. In the postwar period I.P.C. has been building a double 16-in. system paralleling the 12-in. lines except that the one to Haifa is incomplete because of the Israel-Arab controversy.

A third project for a line to the Mediterranean, planned by Middle East Pipe Line Co., is currently inactive but efforts for consumating arrangements have not been abandoned. The line has been intended primarily for moving oil from Iran, but its location would permit it to serve other producing fields at the head of the Persian Gulf also.

**Drilling.**—An amazing thing to an American oil man is the small number of rigs required to develop such tremendous production in the Middle East. In many fields an "active drilling campaign" means one rig running continuously.

Locations are wide apart and in the newer fields, not yet fully defined, many wells are virtual wildcats. But dry holes are rare.

**Production.**—Production is steadily increasing in the Middle East as a whole and in most of the separate countries, and should climb still more rapidly as pipe-line outlets are opened. In April, for instance, production of the Middle East was 1,639,300 bbl. per day, compared with 1,607,400 bbl. daily in March, and 1,485,500 bbl. in April 1949 *(The Oil and Gas Journal, June 22, page 159)*.

The productivity of individual wells is staggering. In Saudi Arabia, for instance, wells with a flowing potential of 10,000 to 25,000 bbl. per day are the rule rather than the exception. For the present, the operators scarcely bother to test promising formations which might be considered major strikes in most other areas.

**Competition.**—The five major operators are very keen competitors, in spite of some interlocking of ownership. Their eyes are chiefly on the big consuming markets of Europe, and there is a real race to see which can get a firm foothold there.

Oldest is the all-British Anglo-Iranian Oil Co., owned 50 per cent by the British Government, and the only operator on the eastern side of the Persian Gulf.

Anglo-Iranian owns a share of Iraq Petroleum Co., other owners being the Dutch-Shell group, a French company, and two American companies—Standard Oil Co. (N. J.) and Socony-Vacuum Oil Co., Inc.

Anglo-Iranian owns half of Kuwait Oil Co., the other half belonging to Gulf Oil Corp.

First all-American entry was Bahrein Petroleum Co., a joint venture of Standard Oil Co. of California and The Texas Co., which has production and a refinery on the island of Bahrein off the Arabian coast.

These same two companies also formed Arabian American Oil Co., but now share ownership with Socony-Vacuum and Jersey Standard.

Thus the corporate linking is evident, but apparently it goes no further. It is quite obvious to a visitor that each one of these companies is fighting to enhance its own position in the world's oil trade.

Another striking observation is the difference in the way of life, dress, and operating methods of what might be called the British and American spheres of activity.

**Difficulties.**—The difficulties of operating in this region are on a scale commensurate with the reserves, the vastness, and the temperature.

First is the royalty, which is high and usually must be paid in gold coin—a scarce commodity which must be scrounged all over the world.

Next is the things which must be done—and which the companies seem glad to do—for the local governments and population.

Most costly in necessity to import everything and construct everything.

**Dollar shortage.**—The latest obstacle to Middle East operations is the dollar shortage and the necessity for operating on sterling or other soft currencies to the greatest possible extent. This is not much of a hardship on Anglo-Iranian, which has always operated virtually 100 per cent on sterling and with British equipment and employes. But it has required drastic changes in the operations of American companies.

But all these obstacles and many more are being taken in stride, and Middle East oil is striding high, wide, and handsome. The tempo is fast, optimism high, and faith in the future unbounded. Barring the possibility of war in the area—a possibility more sensed than openly discussed—no one in the region doubts that Middle East oil will continue to expand at a rate far outdistancing the tremendous growth of the past few years.

# Gas for Northwest

## Newly organized firm proposes 2,175-mile line to carry natural gas from Texas Gulf Coast to Pacific Northwest

**Leigh S. McCaslin, Jr.**

HOUSTON.—Another new gas-pipeline company, Pacific Northwest Pipe Line Corp., has been organized here to build a 2,175-mile, 26-in. $175,000,000 artery from the Texas Gulf Coast to the Pacific Northwest.

The announcement by Pacific Northwest that it has applied for a permit to the Federal Power Commission follows by only a week the disclosure that the Valley Gas Pipe Line Co. had been formed to build a line from this area to southern Michigan. *(The Oil and Gas Journal, June 29, page 41.)*

Robert R. Herring, president of Pacific Northwest, said that the proposed line will deliver 350 million cubic feet of gas daily. The company's FPC application says initial delivery capacity will be 250 million cubic feet per day, but that the company proposes to purchase about 100 million cubic feet daily from Alberta, Canada, fields.

Principal markets would be Seattle and Spokane, Wash.; Portland, Ore.; Salt Lake City, Utah; and Vancouver, B. C.

The 100 million cubic feet daily which the company proposes to obtain from Canada is equal to the amount needed to meet the ultimate needs of the Vancouver market, the company application said.

In addition to the 2,175-mile main line, the company plans to build about 400 miles of 22-in. and smaller lines for gathering and distribution purposes. Total installed compressor horsepower for the main line would be 83,200, consisting of 13 stations of 6,400 hp. each.

Gas for the new line would be supplied by West Texas and Texas Panhandle fields, as well as Gulf Coast reservoirs. If gas can be obtained in Canada, a branch line will be run to the main transmission line of Pacific Northwest.

There are no natural-gas lines into the Pacific Northwest at present. However, three companies are currently contesting for the privilege of building the first line from the new gas fields of Alberta into the area. *(The Oil and Gas Journal, June 29, page 47.)*

The exact route of Pacific Northwest's new gas artery has not yet been decided upon, according to company officials. However, it is expected to cross eight western states. An engineering, construction, and management contract has been signed with Fish Engineering Corp. of Houston. This concern is doing the engineering and part of the construction on the Transcontinental Gas Pipe Line Corp. line, which is currently being built from the Texas Gulf Coast to the East.

Pacific Northwest's president is a young man of 29 who came to Houston 6 months ago from Breckenridge, Tex. He was mayor of that city for 4 years and in the oil and gas business with M. E. Daniel, independent operator.

Tom Jenkins, Houston, petroleum engineer, is vice president of the firm, and Leon Payne, of the law firm of Andrews, Kurth, Campbell & Bradley, also of Houston, is secretary-treasurer.

# Safety Record

## Petroleum industry sets safety mark, A.P.I. says

NEW YORK.—An all-time safety record was established by the petroleum industry in 1949, the annual summary of injuries compiled by the department of safety of the American Petroleum Institute discloses.

A total of 7,751 more employes were covered in the 1949 report than any previous study, thus making this record even more impressive, A.P.I. said. In addition, total exposure exceeded 1 billion hours.

Frequency rate of injuries last year dipped to 10.54 per 1,000,000 man-hours worked, and the severity rate of injuries declined to 1.03 days lost per 1,000 man-hours worked. The institute said that this represents an improvement of 14 per cent compared with the 1948 frequency rate, and 11.2 per cent compared with the 1948 severity rate.

Chances of an employe being injured fatally, the 1949 study shows, are now almost 4,400 to 1, against an average of 2,800 to 1 in 1946. Chances of an emloye being disabled by injury now are 45 to 1, compared with 34 to 1 four years ago.

The greatest improvement in safety performance in 1949 was in the drilling department of the industry, the A.P.I. reported. Here the frequency rate of injuries showed a decline of 24 per cent below the 1948 totals. Among the safest operations were wholesale marketing and refining.

A.P.I. said that the 1949 safety results broke the best previous safety performance established in 1939. During the war years, injury rates increased disproportionately, due to shortage of skilled manpower, and constantly increasing tempo of production and output.

# Refinery Sold

## Sinclair buys Wood River plant, products pipe line

**George Weber**

NEW YORK.—Acquisition of the refining and pipe-line facilities of Wood River Oil & Refining Co. was announced last week by P. C. Spencer, president of Sinclair Refining Co.

The purchase involves a 30,000-bbl. per day refinery located at Hartford, Ill., and a 67-mile products pipe line in northeastern Illinois.

In the Wood River refinery, Sinclair acquires a modern plant incorporating a 7,500-bbl. per day fluid catalytic-cracking unit and new vacuum facilities completed less than a year ago. The refinery also employs 16,000-bbl. per day capacity in thermal cracking facilities, including 10,000 bbl. per day in catalytic reforming and a 500-bbl. per day polymerization unit. The refinery was first built 10 years ago as a 7,500-bbl. plant.

The new Sinclair plant is located on a 431-acre site about 15 miles north of St. Louis and is capable of handling both sweet and sour crudes. Newly installed units afford a high gasoline yield, and the refinery provides flexible operation for manufacture of a wide range of distillates, diesel fuel, fuel oil, road oil, and asphalt.

In addition to its own production, Wood River has for some time processed quantities of crude for Sinclair. The new addition to Sinclair system will serve established company marketing facilities in the strategic St. Louis area. Barge transportation on the Mississippi, Ohio, and Illinois rivers, as well as pipe line, rail, and truck movements will serve a wide area of the Midwest.

**Seven for Sinclair.**—With the purchase of the Wood River refinery, Sinclair plants in this country now number seven. Of these, four, including the newly acquired plant, and those at Houston, East Chicago, and Marcus Hook, Pa., are tied into the extensive company products pipe-line system. This integrated 2,800-mile system extending from the Gulf Coast to the East Coast via Chicago connects to the Wood River refinery with an 8-in. spur line extending from the main line at Standish, Mo.

Including three other Sinclair re-



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fineries at Corpus Christi, Tex.; Sinclair, Wyo.; and Wellsville, N. Y., the company's domestic crude processing capacity now totals 330,000 bbl. Six of the seven plants have an aggregate catalytic cracking capacity of 110,500 bbl. daily, Wellsville having none. Thermal cracking facilities in all plants aggregate 144,000 bbl. per day charge capacity.

No important changes in operating personnel at the former Wood River plant are now contemplated. W. D. Luening is superintendent, Alvert Fosha is assistant superintendent, and B. H. Figy is chief chemist. The Wood River company is headed by Fred C. Koch of Wichita, Kans. Koch and other officers of Wood River are also officials of Rock Island Oil & Refining Co., Inc., which owns a 10,000-bbl. refinery at Duncan, Okla., presently shut down.

## Conservation-Statute Form

OKLAHOMA CITY. — The Interstate Oil Compact Commission has published a suggested form of an oil and gas - conservation statute, Earl Foster, executive secretary, reported last week. Prepared by a drafting subcommittee of the compact's legal committee, copies of the statute are available without cost from compact headquarters, Box 3127, State Capitol Building, Oklahoma City.

# Progress Report

## World's longest pipe line already is half completed

ABOUT 900 miles, or approximately half, of the 1,840-mile Rio Grande Valley-New York City 30-in. line of Transcontinental Pipe Line Corp. has been completed, and initial deliveries of natural gas are expected to be made in New York City by December 1.

Work on the system, which will be the world's longest pipe line, is continuing on schedule. No delays have been experienced in pipe delivery, and by August 1 the company expects to have the last of the pipe on the ground for the major section between Eunice, La., and New York City.

These and other facts on the general progress on the line were reported in the current July Transcontinental News issued by the company. It pointed out that the Federal Power Commission has approved Transcontinental's application to raise capacity to 505,000,000 cu. ft. daily by substituting 30-in. for previously authorized 26-in. and adding 12 new compressor stations to the previously authorized 7.

To provide an auxiliary connection into the New York metropolitan area, the company has asked FPC approval for an 11-mile extension of the main line from New Jersey to Brooklyn. The present connection authorized is across the Hudson River to Upper Manhattan. This new extension will involve another major water crossing in New York Bay.

Work of laying the underwater line across the Hudson River to the Manhattan connection at 134th Street is scheduled to get under way the week of July 10 under the direction of Omaha Dredge & Dock Co. The Hudson crossing, one of 40 made by the line along its route from Texas, will be one of the most difficult. Jet pipes will be used to stir up the river-bottom silt so that the line will sink to a depth of about 25 ft.

A sightseeing boat has been chartered to accommodate a group of company guests who will witness the operation. They will include utility officials, representatives of banking houses, and officials of the companies engaged in building the line.

Transcontinental recently let a contract for the construction of a home-office building in Houston, and much of the foundation work has now been completed. This windowless, gas-air conditioned building will provide an initial 63,000 sq. ft. of floor space in three stories with provision for a future fourth floor. Occupancy is planned by January 1.

*OIL FIELD STANDARDIZATION.—Shown here as they met in Denver, June 30, are members of the American Petroleum Institute's Central Committee on Standardization of Oil-Field Equipment. About 300 oil men and representatives of equipment manufacturers attended the midyear meeting of the standardization committees of the A.P.I.'s Division of Production. Although about 95 per cent of all production equipment has been standardized so that parts are interchangeable throughout the world, the committees meet regularly to make modifications and stimulate technical advances. C. A. Young, Production Division director, estimates that standardization work saves the oil industry between $25,000,000 and $50,000,000 a year.*

*Seated in the picture, left to right, are W. H. Strang, A.P.I., Dallas; P. A. Mills, national secretary, pipe committee, Moody Engineering Co., Pittsburgh; W. D. Stine, national secretary, derrick committee, Gulf Oil Corp., Houston; C. A. Dunlop, national chairman, derrick committee, Humble Oil & Refining Co., Houston; C. A. Young, A.P.I., Dallas; H. W. Ladd, national chairman, pipe committee, Stanolind Oil & Gas Co., Tulsa; Edwin Joyce, A.P.I., Dallas; H. N. Marsh, national chairman, pumping-equipment committee, General Petroleum Corp., Los Angeles; Frances Rodgers, A.P.I., Dallas; W. S. Crake, national chairman, valve committee, Shell Oil Co., Houston; and W. F. Herbert, The Texas Co., Houston.*

*Standing are W. O. Clinedinst, national chairman, gage committee, National Tube Co., Pittsburgh; C. W. Dawson, national chairman, wire-rope committee, Standard Oil Co. of California, San Francisco; A. W. Thompson, Thompson-Carr, Inc., Houston; George B. Kitchel, national chairman, rotary committee, Kerr-McGee Oil Industries, Inc., Oklahoma City; Mercer H. Parks, Humble Oil & Refining Co., Houston; and John M. Payne, national secretary, rotary committee, Shell Oil Co., Kilgore, Tex.*

# New Market for Oil

## Hall process for manufacturing high-B.t.u. gas promises greater residual demand, competition for natural gas

MURRAY BAY, Que.—Exceedingly satisfactory results from the first commercial uses of the relatively new Hall process for manufacturing gas of high B.t.u. content from heavy fuel oil were reported to the Canadian Gas Association at its annual meeting here last week by Hall M. Henry, vice president of Negea Service Corp., Cambridge, Mass.

For the oil industry the process holds promise of supplying a new market for residual fuel oil, replacing coal or coke and distillate fuel oil. For the gas industry it may furnish a means of competing with natural gas, lowering manufacturing costs, and solving the problem of standby and peak-shaving facilities in connection with distribution of natural gas.

The process, developed by research of the American Gas Association, has been in use in Cambridge for about a year and has more recently been installed in several other eastern cities. It produces a gas of 951 B.t.u. or more per cubic foot, virtually the same heating value of natural gas, but it can easily be diluted to 500 to 660 B.t.u. which gives more heat value than other manufactured gas but does not require expensive changes in consumers' burners.

**Economical expansion.** — "High-B.t.u. oil gas," Henry told the association, "offers an economical means of expanding both plant and distribution capacities. For instance, the plant capacity of a manufactured-gas company producing gas of 530 B.t.u. can be increased 80 per cent or more by an expenditure for plant changes which will represent less than 15 per cent of the total fixed capital of a gas company.

"Furthermore, under certain fuel-price relationships, holder (manufacturing) costs can be reduced as much as 15 to 25 per cent through producing oil gas rather than carburetted water gas. In addition, the distribution capacity of such a company, through the expenditure of $10 to $20 per customer for appliance changes to permit the use of high-B.t.u. oil gas, can be increased 80 per cent or more by distributing a high-B.t.u. oil gas."

The Cambridge company, Henry explained, had already had 3 years' successful experience manufacturing high-B.t.u. gas from light oil, which enabled it to reduce its rates $138,000 per year, but recent adoption of the heavy-oil process promises even greater economies. These he calculated in the accompanying table, based on coal and oil prices in New England prevailing in June 1950.

**COMPARATIVE COSTS AT JUNE 1950 PRICES**
(In cents per M.c.f.)

| | Holder cost | Saving |
|---|---|---|
| Carburetted water gas | 51.76 | ..... |
| Light-oil gas | 51.52 | 0.24 |
| Heavy-oil gas | 37.85 | 13.91 |

| | Holder cost plus plant fixed charges at 13 per cent | |
|---|---|---|
| | Total cost | Saving |
| Carburetted water gas | 77.76 | ..... |
| Light-oil gas | 62.52 | 15.24 |
| Heavy-oil gas | 49.55 | 28.21 |

**Distribution economies.** — In addition, Henry pointed out, there is a saving in the fixed charges on the distribution system by using heavy-oil gas, which in Cambridge amounted to 3.7 cents per M.c.f.

This distribution saving comes about through the fact that existing mains can carry more heating value when high-B.t.u. gas is used. Where the heavy-oil gas is distributed at its full 950 or 1,000 B.t.u. there is considerable expense in converting customers' equipment designed for manufactured gas of 528 B.t.u. But Henry reported that when the gas is diluted with air to around 600 B.t.u. the changeover cost is quite moderate.

Another technical paper was presented by A. B. Lauderbaugh, chief gas engineer of Manufacturers Light & Heat Co., Pittsburgh, on fundamentals of galvanic corrosion. He explained the many ways in which stray currents can cause underground corrosion in distributions systems and ways to prevent corrosion by the use of anodes and insulating connectors.

One of the feature addresses was by Hugh H. Cuthrell, president of the American Gas Association. He declared that until a few years ago the gas industry appeared to be decadent, with its plants obsolete and its service poor, but it has now taken on new life with aggressive research and promotion.

Hugh G. Smith, secretary of Consumers' Gas Co., Toronto, was elected president of the Canadian Gas Association for 1950-51.

# WEST COAST

## SOCAL Raises Crude Price

SAN FRANCISCO. — Standard Oil Co. of California has increased prices it pays for heavy crude oil it purchases, and at the same time increased selling price for heavy fuel oils by 15 cents per barrel.

The company will generally increase its buying price for 14°-gravity crude by 15 cents a barrel, and lesser increases will be made for other gravities up to 25°. All prices are effective as of June 29, the company said.

This increase in crude-oil prices partially restores previous cuts made several months ago (up to 30 cents per barrel), caused by over-production of the heavier grades.

The former price of Wilmington 14-14.9°-gravity crude was $1.28, and the new price is $1.43. Rise in price graduates down to only 1 cent for 25-25.9°-gravity Wilmington crude, raising from $2.30 to $2.31 per barrel. No prices will be affected above 25.9° gravity.

Union Oil Co. posted a similar advance effective July 1, and General Petroleum Corp. likewise met the increase. At the weekend Shell Oil Co. and Richfield Oil Corp. still were studying the situation.

The price change will affect some 400,000 bbl. daily of California's current production of about 872,000 bbl. Of the 25°-gravity and heavier crude, about 180,000 bbl. is below 20° gravity.

## Well-Spacing Ruling

LOS ANGELES.—California's well-spacing act was declared unconstitutional in a District Court of Appeals case decided here last week.

The decision was rendered in the case of John C. Hunter, who owns two lots in the Athens area and which total 0.39 acre and who did not wish to have his properties included in a community lease which Shell Oil Co. held. A California statute forbids drilling on sites of less than 1 acre, but despite the code Hunter had started a well.

The court conceded that the state's well-spacing regulation was a departure from the rule of capture, but said its enactment was in the interest of public welfare as it prohibited overdrilling and waste of petroleum. It further ruled that such well-spacing laws are well within the police power of the state.

The court held, however, that the law, as applied to Hunter's property, deprived him of his rights to recover his fair share of oil from the reservoir, "and to that extent unlawfully invade petitioner's constitutional rights."



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## SPECIAL REPORT

# The New FPC

### A reorganization plan, two new members, an appointed chairman pose questions on regulation of natural gas

**Bertram F. Linz**

WASHINGTON. — Just what the recent reorganization of the Federal Power Commission is to mean is something that will be developed as time goes on.

At best, as claimed by administration supporters, it will make the chairman responsible for the day-to-day administration of the commission, as recommended by the Hoover commission, and will involve no interference with the other commissioners or in the handling of the commission's affairs.

At the worst, as contended by opponents who failed to halt the reorganization by a dozen votes, it will make for a commission dominated by the President's hand-picked chairman, who will decide what the commission is to do and how it will do it, and determine how its appropriation is to be spent.

On the face of it, the reorganization plan sent to Congress by President Truman March 13 provided that the chairman of the FPC should be appointed by the President and vested with responsibility for appointment and supervision of commission personnel, distribution of business among the staff, and the use and expenditure of funds.

In the conduct of all these activities, the President explained in a message, the chairman will be bound by the general policies established by the commission and by its regulatory decisions, findings, and determinations. In addition, the right is specifically reserved to the commission to revise budget estimates and determine the distribution of funds among the major programs and purposes of the agency. The appointment of the heads of major administrative units is to be subject to approval of the commission, and each commissioner will retain responsibility for actions affecting the personnel in his immediate office.

Thus it would appear that the reorganization merely provided that the chairman, formerly elected by the commission itself and rotating annually, would hereafter be appointed by the President and made responsible for the "housekeeping" duties heretofore scattered among the several members of the FPC. But opponents saw considerably more than this in the President's plan.

The fight in the Senate to kill the proposal was based largely on the contention that when the FPC was set up by Congress it was intended to be a bipartisan agency to carry out the will of Congress and not reflect the views of the President or the administration. With the President empowered to name the chairman, who will have the power to do all the hiring, firing, and housekeeping functions, it was charged, the President controls the commission.

Opponents also noted the possibility of "hold over" control of the FPC, by reason of the fact that commissioners are appointed for terms of 5 years and it is conceivable that a President in the final year of his term might select as chairman a member of the commission appointed by him during that year who would serve not only during the last year of the presidential term in which he was appointed but likewise 4 years of the succeeding term even though there may be a change in the administration.

Administration forces made capital of the fact that while the chairman could nominate administrative heads and determine the distribution of funds, actual decisions would have to be made by vote of all the commissioners. Opponents dismissed this with the argument that as many as three of the five commissioners may be members of the same party as the administration and the President's policies, filtered through his appointed chairman, could readily secure the approval of a commission majority.

So far, the reorganization has not brought any material changes in commission policy, procedure, or operations, according to FPC officials. But the problem of administrative appointments has not yet risen, and the commission has not yet received its appropriation for the fiscal year beginning July 1.

In one respect the contentions of the opponents of reorganization have been borne out. Mon C. Wallgren, youngest member of the commission in length of service, having taken office only November 2, 1949, was named by the President to be chairman. President Truman's term expires January 3, 1953, but Wallgren's term does not expire until June 22, 1954, so he could conceivably serve nearly 18 months under a new administration not in sympathy with present policies.

The terms of all the commissioners expire on a June 22, one each year. This year, Nelson Lee Smith, who went on the commission October 26, 1943, finished up his term but he has been nominated for another 5 years of service by the President. Next year, the expiring term will be that of Claude L. Draper, who took office December 23, 1930; in 1952 it will be Thomas C. Buchanan, who joined the commission July 14, 1948, to fill an unexpired term; and in 1953 it will

*Present members of the Federal Power Commission: Thomas C. Buchanan, Claude L. Draper, Nelson Lee Smith, Harrington Wimberly, Chairman Mon C. Wallgren.*

be Harrington Wimberly, who was sworn in October 5, 1945, also to fill an unexpired term.

Since it is only recently that there have been five men on the commission, after 2 years in which there was an unfilled vacancy, and no new major issues have arisen in the field of natural gas, there is as yet no definite line that can be drawn as to the commission's position on such questions as regulation of independent producers and gatherers.

However, in the natural-gas investigation which started in 1944 and wound up in 1948 with two reports, and in various matters which arose during that period, including the control of independent producers and gatherers, Smith and Wimberly were on the moderate side while Draper and former Commissioner Leland S. Olds advocated broad regulatory powers for the commission.

Wallgren, former senator from Washington and later governor of that state, is a long-time friend of the President, who first sought unsuccessfully to have him appointed chairman of the National Security Resources Board, and probably can be depended upon to go along with the President's views, which were expressed, in part at least, in his message vetoing the Kerr bill to exempt independent producers and gatherers of natural gas from FPC control.

Buchanan, formerly a Pennsylvania utilities commissioner, is believed to hold views paralleling those of Olds and Draper. If this proves to be the case, the advocates of strong government control will be in the majority. It is expected that the line-up of the individual commissioners will be disclosed in action taken in the Phillips Petroleum Co. case to determine whether it is subject to federal regulation, now pending.

## NATIONAL AFFAIRS

# Changed Imports View?

### Neely committee asks another delay in filing report after Korean attack and Mexican trade agreement abrogation

WASHINGTON.—Deadline for the filing of a report on the effect of oil imports upon the domestic oil and coal industries by a Senate labor subcommittee which has been investigating the situation has been extended from July 5 to July 15.

Sen. Matthew M. Neely of West Virginia, chairman of the subcommittee, said the delay was asked by the other members, Sens. Robert A. Taft of Ohio and Elbert D. Thomas of Utah. The deadline originally was June 25, but Neely himself asked for a 10-day extension of time.

There is speculation in Washington over what Neely will say about imports in the light of the denunciation of the Mexican reciprocal trade agreement and the Korean situation. During the hearings, it was apparent that he was not influenced by arguments from representatives of the importing companies that there was need for foreign oil, and he had indicated his intention of laying the matter before President Truman with a request that he exercise such powers as he might have under the Reciprocal Trade Act to curb imports.

**One report filed.**—Meanwhile, Rep. Eugene J. Keogh of New York, chairman of the House small business oil subcommittee, filed his report last week, reportedly after fending off efforts of committee chairman Wright Patman of Texas to make it denunciatory of the importing companies.

In that report, written before the communist invasion of South Korea, Keogh emphasized the necessity to have foreign oil available in the event of a military emergency, although there was a possibility that imports may have been excessive under the conditions which have prevailed in the immediate past.

Keogh also recommended that the President study the possibilities of dealing with the situation under the Reciprocal Trade procedure and suggested the companies might control the situation by voluntary agreement which Congress might exempt from antitrust prosecutions, but he warned that if Congress deems legislation necessary to regulate imports it should not take action without a much more comprehensive study.

**No action expected.**—The termination of the Mexican agreement, invasion of Korea, higher production allowables in Texas and steadily rising domestic demand were seen, however, as effectively eliminating the possibility of any action on imports by Congress this year, although it is still expected that an effort may be made in the Senate to tack a $1.05 per barrel excise tax on imported oil onto the tax-revision bill when it comes up for consideration.

The disinclination to tamper with the oil situation was evidenced in the House June 29 when it rejected amendments proposed by Reps. Ben H. Guill of Texas and Leon H. Gavin of Pennsylvania to include petroleum in a bill extending the power of the President to control imports of vegetable fats and oils.

A number of oil-country members made pleas for acceptance of the amendment but administration spokesmen defeated it readily on the ground that the President had authority to deal with oil under other laws and the likelihood that he would take no action if the amendment was adopted.

# FTC Study

### Ten oil investigations have brought no help, Peck says

WASHINGTON.—Ten congressional investigations of the oil industry during the past few years have brought no results beneficial to the smaller enterprises in the industry, and there is a "suspicion" that some of them were launched only to halt a real investigation by the Federal Trade Commission, the House small-business committee was told last week by Rankin Peck, president of the National Congress of Petroleum Retailers.

One of a number of small-business spokesmen testifying in the committee's study of the functioning of the FTC, Peck urged support for the Cannon resolution for a comprehensive economic study of the world oil situation by the commission.

Previous witnesses before the committee charged that restricted appropriations and lack of cooperation between the commission and the Department of Justice are hamstringing enforcement of the antitrust laws, but Peck went much further and questioned whether Congress, for all its talk against monopoly, has sincerely supported the FTC.

Other questions raised by Peck were whether weak enforcement is due to the appointment of men to the antitrust agencies who "do not have any great enthusiasm for the antitrust laws and any zealous interest in their enforcement or in a policy of fair competition"; why the Department of Justice was unwilling to argue the Standard Oil Co. (Ind.) case in the Supreme Court; why there is so much delay in the handling of cases by the FTC, and why the Department of Justice has failed to use the criminal provisions of the Robinson-Patman Act.

Peck told the committee the Justice Department has opposed an all-out FTC oil investigation, which was confirmed by justice officials who explained it would duplicate investigations they are now making.

"Such information as we can get indicates that over the years at least 10 investigations have been made of the same subject by the various committees of Congress. But we cannot discover any results from those inves-



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tigations which are, or would be, beneficial to the small businessmen. They have not provided the array of carefully organized facts which an independent investigatory body can develop and which are necessary to lay the groundwork for any legislation. Hence, there is at least the suspicion that some congressional investigations are launched only to halt a real investigation by the commission."

Peck offered a number of suggestions for better enforcement of the antitrust laws including amendments to the Clayton Act, one of which would withhold the right to select customers from dominant companies controlling basic supplies and require them to sell to all customers offering cash payment.

## War Outlook

### Emergency plans for oil ready if and when needed

WASHINGTON. — Administration officials are hopeful that the conflict in Korea can be localized and kept from spreading into a general war, and plan no immediate action imposing any controls on the economy.

Just as insurance, however, the results of some 4 years of planning for civilian, industrial, and military mobilization in the event of an emergency are being brought out of the files, handy for quick application should the situation in the Far East prove to be the fuse touching off another war.

The 20-chapter war-control bill prepared by the National Security Resources Board, for instance, could go to Congress promptly if it became necessary to direct materials and manpower into military production. The bill was originally drafted 2 years ago, when President Truman had the idea Congress should enact war-powers legislation to be laid on the shelf until needed.

Under the NSRB plan as first disclosed, that agency would be the control center for all civilian and industrial activities. It would administer all the controls that in the last war were scattered among a number of agencies—price and wage regulation, rationing, manpower distribution, priorities, and allocations — and among other things would handle the problems of oil which were vested in the Petroleum Administrator for War.

**Would cooperate.**—The NSRB would work in cooperation with the Defense Department, which has its own plans for industrial mobilization and has placed "phantom orders" in many industries which could be put into production by telegraph. The refining industry, for example, has been given an idea of what would be required

## WATCHING WASHINGTON

**Bertram F. Linz**

### Coal and Korea

The coal industry has seized upon the Korean situation as a major argument for sharp curtailment of oil imports to insure the availability of adequate coal supplies in the event an emergency develops.

Warning that to permit industrial operations to become dependent upon a foreign source of energy, in this instance residual fuel oil, may be "national suicide," spokesmen for the industry assert that utility plants on the eastern seaboard have only a 4-day supply of oil on hand and cannot increase it because of lack of storage facilities.

"What happens if the tankers carrying this alien cargo are suddenly waylaid by a pack of snorkel submarines?" they ask.

### Antitrust Record

Attorney General J. Howard McGrath appears to be out to better the record made by Tom Clark, his predecessor, in bringing antitrust suits.

Clark averaged about 40 suits a year over the period he was head of the Department of Justice, which was about the average per term of his predecessors, but it looks like McGrath is just getting steam up for a drive that will make all previous drives look like dribbles.

Last week, for instance, McGrath hit a pace of better than one suit per day.

Many of the suits brought by McGrath were worked up, of course, while Clark was in the department, but a lot more have been put under investigation since the present attorney general took over. Department officials, of course, won't say what or how many cases are in the works, but have intimated that a steady stream of suits may be expected for some time to come.

### Oil's Steel Needs

Consumption of steel by the oil and gas industries has more than doubled since 1946 in volume and has nearly doubled in percentage of total consumption.

Shipments for oil and gas use last year, including jobbers and construction, totaled 4,478,161 tons or 7.7 per cent of total consumption, as compared with 2,010,460 tons or 4.1 per cent of consumption in 1946, according to figures compiled by the American Iron and Steel Institute.

For nearly 3 months, now, steelmaking operations have been at a rate in excess of rated capacity of the industry, and steel manufacturers see the possibility of a 90,000,000-ton output this year for the first time in history.

Industry spokesmen, however, give assurance that even higher tonnages will be possible in the event of an emergency, pointing out that before the end of the year the country will have about 102,000,000 tons of steel-ingot capacity and will add more than 2,000,000 tons additional capacity next year.

The one dark spot in the picture is the limited capacity of fabricating facilities. A recent survey of the industry shows that pipe producers are sold out for the balance of this year, except for tonnage held back for jobbers' allotments, and have orders that will carry them well into next year.

### No Policy Now

History is repeating itself, as usual, and Congress will not enact a national oil policy this year.

For a number of years, members have talked a lot about the need for a fixed oil policy on domestic and international oil issues, and innumerable investigations and hearings have been conducted by committees, but the matter seldom reaches the stage where any effort is made to write legislation.

Last August, Rep. Oren Harris of Arkansas, chairman of the House interstate commerce oil subcommittee, made a stab at writing legislation to create a Petroleum Policy Council to develop, clarify, and coordinate national oil policies, only to hear his bill lambasted at a meeting of the National Petroleum Council at which he was present. The measure also was received with a marked lack of enthusiasm by the federal agencies dealing with oil.

The subcommittee held a number of hearings this year but never got into a study of the Harris bill specifically.

With Congress seeking to adjourn by the end of this month, only new legislation on most pressing matters has any chance of getting recognition.

January will bring a new Congress, and everything will have to start from scratch, which means another series of investigations before any legislation on oil can be developed.

of it in an emergency, both as to products and volume, and while there would be some changes it could get into big-scale military production quickly.

Proponents of a curb on oil imports found themselves up against the cold hard fact that in the event of war the United States would need all the petroleum it could get, both foreign and domestic, and a period of uncertainty is no time to jeopardize that supply.

Even the reassuring report from Frank M. Porter, president of the American Petroleum Institute, that domestic production of crude could be boosted overnight to more than 6,000,000 bbl. a day gave no promise of adequate supplies in the event of an emergency, and Porter himself referred to the new reserves created since the war in Canada, South America, and the Middle East as adding to our supply "to the extent of our ability to give military protection" to those areas.

## Synthetics Bill Introduced

WASHINGTON. — Legislation designed to encourage the establishment of a synthetic liquid fuels industry has been introduced in Congress by Rep. Robert L. Ramsay of West Virginia.

Ramsay's bill would amend the Internal Revenue Code to provide that a commercial manufacturer of synthetic liquid fuels would be permitted to amortize his investment in a period of 60 months.

The accelerated amortization, however, would apply only to facilities for production of liquid fuel from coal in amounts of not less than 5,000 bbl. a day.

Ramsay explained that he is seeking in this way to interest the railroads in the production of synthetic liquid fuels, which they themselves could use. The railroads have ready access to coal and would have no transport problem, he said, and elimination of distribution costs, plus the tax incentive, should enable them to utilize synthetic fuels on an economically feasible basis.

Manufacture of synthetic liquid fuel, Ramsay pointed out, would take up some of the employment slack on railroads and in coal mining occasioned by dieselization and at the same time protect the railroads against a possible break-down in the event of another war and the critical oil shortage which would occur.

## Tidelands Aftermath

WASHINGTON. — Legislation that would require that all cases in which the Supreme Court has original jurisdiction must be decided by a majority vote of the full court has been introduced in Congress by Rep. J. M. Combs of Texas.

The Combs bill is designed to avert a repetition of the manner in which the Texas tidelands case was disposed of by a four-to-three vote with two members of the court not participating.

Under the legislation at least five members of the court would have to approve a decision in any case brought originally before the court, as were the three tidelands cases.

Combs contends that a minority, as in the Texas case, should not be permitted to set the policy of the Supreme Court and lay down new doctrines and principles.

## Price Investigation Pending

WASHINGTON.—The Senate rules committee will meet July 12 to decide whether to permit a floor vote on the Ferguson resolution for a $50,000 inquiry into gasoline prices.

The committee took the measure up last week after the judiciary committee approved it by unanimous vote, but decided to defer action until it could determine whether the inquiry would duplicate one said to be under way by the Department of Justice.

At the department, officials refused to confirm or deny the report that they were studying gasoline prices, but it is known that agents have been actively at work in various sections of the country looking into a number of phases of the oil business.

The investigation was proposed by Sen. Homer Ferguson of Michigan as a result of the latest increase in gasoline prices in the Detroit area. One of the points that Ferguson wants to bring out is that prices are as high in states having low gasoline taxes as in neighboring states with much higher levies. If approved by the rules committee and passed by the Senate, the investigation would be made later this year and a report submitted upon the return of Congress.

# SOUTHWEST

## New Reef Pay

### West side of Permian basin gets reef production

DALLAS.—West Texas' hottest wildcat, Anderson-Prichard Oil Corp.'s 1 H. C. Bevers, NE NE 39-DD-John H. Gibson Survey, in south Terry County, has added Canyon reef production to the west side of the Permian basin.

Electrical surveys had not been made early this week, and the reef call was only tentative. Operators, however, were confident as to the formation, based on core recovery, and observers and other geologists concurred with their findings.

The drill-stem test, believed to be in the top of the reef, was made to 9,761 ft. Three hourly gages recorded between 21.7 and 34.8 bbl. of clean 41°-gravity oil.

The hole was deepened to 9,811 ft. and another drill-stem test was planned, to be followed by electrical surveys.

The 1 Bevers is located about 5 miles east of the town of Wellman and about the same distance northwest of Adair San Andres field. It is 11 miles northwest of the new Corrigan field of southeast Terry County.

Nearest Pennsylvanian production is the two-well Mound Lake field, 20 miles to the northeast in Terry County. The Mound Lake discovery, the 1 Hinson of Seaboard Oil Co., is generally considered to be a reef well, since it had muggy and fractured limestone pay, but at the time of its completion in March of 1949 reef development was not so intense and the well was classified as a Pennsylvanian discovery.

The 1 Bevers originally was projected to 11,000 ft.

*FLAW FINDER.—A quick way to find cracks in metal, developed by Northrop Aircraft, Inc., for inspection of gas turbines, is now available to the oil industry. It is said any mechanic can use the kit containing three chemicals. A red dye is painted on the metal, wiped off with a special chemical, and covered with a white developer which, by capillary action, draws the dye from cracks and makes them easily visible to eye or camera.*



XUM

# Production Analysis

## Combination of several factors accounts for present rate of foreign production 10 per cent above last year's level

Dahl M. Duff

A COMBINATION of factors, some of which are short-term in nature, appears to be behind the recent somewhat spectacular increases in foreign crude-oil production.

These recent production gains have been most outstanding in Venezuela, where five successive weekly output records have been established. Most Persian Gulf areas also are at record levels. Other marked gains have been shown in Mexico and Colombia.

Growing foreign demand for oil, the high level of imports into the United States, additions to working stocks, and recovery of strike losses in Venezuela are the principal reasons given by officials in the industry for the heavy production increases.

**Demand is greater.**—Present foreign demand for oil is estimated to be about 10 per cent above this time last year. Preliminary figures show an 8 per cent increase in the first quarter of this year. Demand is rising both in Europe and in Latin America.

Removal of rationing controls in the United Kingdom, New Zealand, and Australia has contributed to this upsurge in demand. An estimated 20,000 bbl. daily in gasoline and road diesel was added to consumption by these derationing moves.

Improvement of the currency positions of several European countries also has been mentioned in connection with foreign petroleum demand. The franc and lira both have strengthened with a beneficial effect on the international oil trade. Stronger currencies leads to liberalization of import restrictions.

**Imports a factor.** — Imports into the United States, though slightly lower in April as compared to March, are at a rate considerably above last year. The importance of these shipments to the foreign oil industry is pointed up by the fact that United States imports of crude and products in April of 837,000 bbl. daily represented more than 21 per cent of total estimated foreign crude production in that month excluding Russia and Eastern Europe. Considering crude imports alone, the percentage of U. S. imports to total foreign production is 11.8.

A major part of this oil entering the United States comes from Venezuela directly or indirectly through the refining centers at Aruba and Curacao. Aside from the pros and cons of the controversy over the desirability of these imports to the United States oil economy, the fact remains that they have contributed considerably to the upsurge in foreign production.

The East Coast residual fuel oil market exerts considerable effect on the import level. Partly as a result of the coal strike, first quarter residual demand was up more than 25 per cent in the East and on the Gulf. It is expected to be 15 to 17 per cent higher the remaining three quarters of the year. Foreign residual meets about a third of this demand.

**Stocks increasing.** — As far as additions to foreign working stocks are concerned, one of the most notable is the approximately 7,000,000 bbl. total required for the Trans-Arabian pipe line and now being produced by Arabian American Oil Co. in Saudi Arabia. This includes some 5,000,000 bbl. for the line itself and 2,000,000 bbl. for the tankage at Sidon on the Mediterranean. This is adding about 35,000 bbl. daily to Aramco's production.

The growing foreign demand for oil requires additional industry working stocks all along the line from well to consumer. A sizable part of the storage in Europe and in some other Eastern Hemisphere areas was destroyed during the war, and the rebuilding of this has been continuing since. Furthermore, in recent months several new refinery units have gone on stream in Europe, all requiring additional stocks.

Even with the important Haifa plant shut down, foreign refinery capacity in total is more than adequate to meet present demand requirements. The increasing foreign refining capacity is reflected in the decreasing trend of exports out of the United States. Shortly after the war, lack of refining capacity forced European dependence on American exports.

**Strike effects.** — Another short-term stock factor in the foreign production increase is that which has been taking place in Venezuela. In that country, the general oil strike early in May resulted in severe drafts on stocks. There have been reports Venezuelan stocks are being built up beyond the point that existed prior to the strike. This accounts in part for the unprecedented rate of production recently in that country.

One official familiar with the situation in Venezuela said that in addition to the recovery of strike losses the production rate in Venezuela is due to greatly increased demand in Western Europe and in several South American countries, including Brazil and Ecuador. He also pointed out that crude imports by American refiners were recently resumed in Argentina. No substantial part of the increased Venezuelan production in recent weeks is coming into the United States, it was said.

The latest of the Venezuelan production records was set the week ended June 19 with 1,580,129 bbl. daily. Previous daily averages were: week ended June 12, 1,565,100 bbl.; week ended June 5, 1,536,100 bbl.; week ended May 29, 1,512,000 bbl.; and week ended May 22, 1,497,900 bbl. Prior to the strike, Venezuelan production was about 1,425,000 bbl. daily.

Preliminary reports show that production in the Persian Gulf was at about 1,750,000 bbl. daily in May. There are indications this may be exceeded in June. The May total compares to an April production in this area of about 1,640,000 bbl. daily.

## FAR EAST

### Oil Men Leave Korea

The small staffs of the three oil companies marketing in Korea were evacuated to Japan last week shortly after the Communist invasion of the American-sponsored South Korean Republic.

The companies involved are Standard-Vacuum Oil Co.; Caltex, and Shell. Standard-Vacuum had a staff of seven, and the entire group of foreign oil employes in Korea was estimated to be not more than 25.

The Korean market has been met by Economic Cooperation Administration purchases. These were scheduled at 2,000,000 bbl. of products this year or at a rate of about 5,500 bbl. daily. This compares to about 2,500,000 bbl. total imported into all of Korea in the prewar year of 1938.

The distribution setup was similar to that which has been followed in Japan. A Korean Oil Storage Co., made up of representatives of the three companies, operated the storage and import terminals, though its functions as an importer and supervisor of distribution were terminated last November.

### China to Press Oil Search

The Communist Government now holding all the mainland of China is attempting to extend the present small production in the northwest part of the country.

A national conference on oil was

held recently in Peking and the decision was made to begin at once on a 3-year program of reconstruction of the Chinese oil industry, according to a Russian news agency report.

The training of personnel for employment in synthetic oil plants in Manchuria as well as in exploration in northwest China was agreed on. A number of geological prospects have previously been outlined in China, but the only field is Yumen in Kansu Province. The Moscow Radio, however, recently claimed that oil had been discovered in the northern Chinese province of Shensi.

## EUROPE

# More Refining

### Refinery goes on stream in Spain; expansion planned

A 5,000-BBL. daily refinery at Escombreras near Cartagena in Spain has been officially opened and placed on stream.

Controlling interest amounting to 52 per cent is held by the Spanish Government through the National Institute of Industry. The remaining interest is held 24 per cent each by the Caltex organization and by Cia. Espanola de Petroleos, S.A. (Cepsa).

Capacity of the newly finished refinery is to be expanded to 20,000 bbl. daily with the installation of additional equipment. About 140,000 bbl. a year of lubricating oils are to be produced when the plant is brought into full-scale operation.

The Escombreras refinery is the first in Spain itself and is of considerable importance to the Spanish economy. Cepsa operates a recently enlarged and improved refinery of more than 15,000 bbl. daily capacity in the Spanish Canary islands.

The country has depended on foreign imports, the Canary Islands refinery production, and the small output of a shale distillation plant at Puertollano. Through the first 11 months of last year, total product imports into Spain were at a rate of about 22,800 bbl. daily, including gasoline 36 per cent and fuel oil, 37.2 per cent. Shortages and high prices have in general held down petroleum consumption in Spain.

The fully completed Escombreras refinery will have modern equipment for crude distillation, thermal reforming, polymerization, and other facilities, including those for lubricant, paraffin wax, and asphalt production. Work on the refinery was originally commenced by Spanish interests prior to the war.

A year ago, a new company was organized to resume the work. This was Escombreras Petroleum Refinery, S.A. (R.E.P.E.). At that time reports were that Caltex was making a $9,000,000 loan to the enterprise and that it had received certain government guarantees for dollar remittance of dividends. The undertaking was of general significance in that it marked the first major combination of Spanish and United States capital since the war.

## Pipe Order Placed

Steel pipe totaling 5,940 tons, most of which will be used for construction of a crude-oil line to Winnipeg in Canada, has been ordered from Steward & Lloyds, Ltd., Glasgow, Scotland, by the Standard Oil Co. ( N. J.) organization.

The order was placed through Jersey Standard's British affiliate, Anglo-American Oil Co., Ltd., and presumably represents use of some of the sterling balances provided for under the company's recent arrangements with the British Government.

The order includes 80 miles of 10¾-in. line pipe, 55,000 ft. of 8⅝-in., and 300,000 ft. of 7-in. casing. The pipe line will move crude to Imperial Oil, Ltd.'s new Winnipeg refinery now under construction, from a connection with the Edmonton-Superior, Wis., line. It will be built by an Imperial subsidiary, Winnipeg Pipe Line Co.

## Greece to Make Oil Study

A study of the possibility of finding oil in Greece has been provided for under a new agreement between the Greek Government and the Economic Cooperation Administration's mission to that country.

The new agreement emphasizes Greece's need for oil, pointing out that at present Greece imports all of its petroleum products requirements at an annual cost in foreign exchange equivalent to $32,500,000.

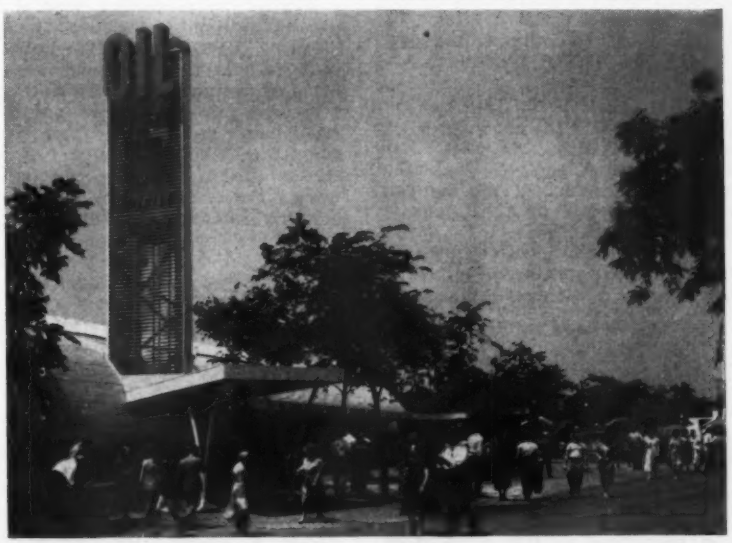
The ECA arrangement with the Greek Government also calls for continuing previously begun mineral surveys to June 30, 1951. Over the past year, 3,620 million Greek drachmas from the Marshall Plan local counterpart fund have been authorized to finance geological and geophysical surveys. Another 3,180 million drachmas have been appropriated from Greece's Marshall Plan "drawing rights" on other countries. Together, these sums are the equivalent to about $455,000.

## Plant Conversion Approved

German proposals for the conversion of the Wann-Eickel Fischer-Tropsch plant to the production of alcohols have been approved by the Allied High Commission for Germany.

The plant, located in the Ruhr area, produced synthetic oil during the war. After conversion, it will use the "exyl" process for producing high-grade alcohols.

The Allied commission also has under study a similar German request for the conversion of another Fischer-Tropsch plant at Bergkamen. The two plants ceased production at the end of last year in accordance with Allied orders prohibiting the synthetic operations.




*PUBLIC SERVICE.—A popular spot at the Chicago Fair this summer is this Oil Industry Service Center maintained by 17 oil companies and associations operating in the Midwest. No products are sold, but the center forms a lounge, rest rooms, information service, telephones, news bulletins, weather reports, picnic tables, and even foot vibrators for weary sightseers. It is decorated with hugh photomurals depicting varied operations of the petroleum industry. A small movie theater continuously shows a series of 15 educational films about the oil industry.*



XUM

## LATIN AMERICA

# Gulf in Barbados

### Gets exploration rights in British West Indies

THE Government of Barbados, British West Indies, has granted an oil exploration license to Gulf Oil Corp. over approximately half of the 166.3 sq. miles of the island.

The license was signed by the Governor-in-Executive Council after negotiations and discussions with two oil companies. The island government was assisted by N. E. Tanner, minister of Mines of Alberta, who arrived in Barbados early in April to advise the colonial officials.

Barbados recently approved a new petroleum act vesting oil rights in the Crown and authorizing the Governor-in-Executive Council to grant licenses and leases. *(The Oil and Gas Journal, June 15, page 85).* The main points of the new agreement with Gulf are as follows:

1. An exploration license for 4 years over 85.3 sq. miles, such area to comprise the following parishes: St. Lucy, St. Peter, St. Andrew (excluding existing natural-gas wells), St. Joseph, St. Thomas, and Christ Church.

2. An exploration license over the territorial waters contiguous to that part of the leeward coast which lies between Harrison Point Lighthouse and the point where the boundary of St. Peter's Parish meets the coast.

3. The right to lease 50 per cent of the prospecting area in one or more lots for 21 years renewable for a further 21 years, and the option to acquire leases of the remainder at a competitive price.

4. The royalty to be 12½ per cent for 21 years, and thereafter at a rate not exceeding 16⅔ per cent if the Governor-in-Executive Council so prescribe. In addition, the company will pay a rental of $1 a year for every acre under lease.

The Barbados license shows the Gulf company's continuing interest in the Caribbean-Central America region.

## Creole Stock Shift

Standard Oil Co. (N. J.) is seeking to increase its ownership of Creole Petroleum Corp. from 92.9 per cent to more than 95 per cent in order to gain a tax savings.

The Jersey company confirmed that it is preparing to file a statement with the Securities and Exchange Commission covering an exchange offer designed to acquire about 500,000 shares of Creole.

It is planned that the exchange will be made at the rate of 8 shares of Jersey for 15 of Creole and that only the 500,000 Creole shares will be accepted. By the increased ownership, Jersey and Creole would be able to file consolidated federal tax returns with resulting savings for the Jersey company.

## Tropical Transfers Assets

The Colombian Exchange Control Office has authorized Tropical Oil Co. to transfer distribution facilities of $22,614,000 value to the new company, Esso Colombiana, S.A.

Tropical will register the assets in Esso Colombiana in the name of its parent company, International Petroleum Co., Ltd. International will thus become the principal shareholder in Esso Colombiana which will own all of Tropical's marketing facilities throughout Colombia.

The action of the Exchange Control office was interpreted as reflecting a more favorable attitude on the part of the government to the oil industry in general. The assets are registered on a dollar basis, exempt from the tax on foreign-exchange operations.

## AFRICA

## Oil Search Dropped

After spending the equivalent of approximately $250,000 on oil exploration without success, the South African Government plans no further expenditure for work of this type.

This was noted in a recent report from Johannesburg. While discontinuing further outlays of its own for exploration, the government will investigate any promising reports that may be received in the future.

South Africa depends wholly on imported products and for some time has been studying the possibility of a coal-to-oil conversion plant. In Parliament recently in Cape Town, the South African minister of economic affairs said that negotiations were proceeding with American banking interests for funds for the project.

## MIDDLE EAST

# Haifa to Reopen

### Shutdown refinery again to operate on limited scale

AN agreement for the partial reopening of the Haifa refinery within 3 months was reached last week in London.

The plans for resuming operations at the plant resulted from 2 weeks of negotiations in London between Israeli Government representatives and officials of Anglo-Iranian Oil Co., Ltd.

The source of crude oil for the blockaded plant was not disclosed. The assumption in London was that it would be shipped from Latin American ports. The refinery has been closed down for more than 2 years because its normal supply of Middle East crude has been shut off as a result of the Israeli-Arab war.

**Runs to be limited.**—According to reports in London, the refinery will process about 1,000,000 tons or at a rate of some 20,000 bbl. daily. This would be less than 25 per cent of its full rated capacity of 83,000 bbl. daily.

Officials of the Israeli Government have been pressing for reopening of the refinery, and it was reported that the country would be saved $3,000,000 a year, representing the difference in the cost of the present imported products and that of the crude now to become available.

The Haifa refinery is operated by Consolidated Refineries, Ltd., jointly owned by Shell and Anglo-Iranian. It formerly was an important source of products for Europe, but new refinery construction in Europe over the last 2 years has made the need for its output less urgent.

Despite plans for the refinery opening and the prospects of an improved products supply, it was reported from Haifa that the Israeli Government would raise motor-fuel prices by about 20 per cent, impose a higher excise fee, and restore rationing of gasoline. Haifa sources said the plant reopening would provide employment for about 700 persons and that its output would cover about 65 per cent of Israeli's gasoline needs. The remainder is to come from American oil-company interests.

**History.**—The Haifa refinery first went into operation in December 1939. Crude was provided through a 12-in. line from Kirkuk field in Iraq, and a 16-in. was nearly complete in the spring of 1948 when the Iraqi Government shut off further movement of crude to the new Jewish state.

Efforts, largely at a government level, have been made almost continuously since that time to bring about the refinery reopening. Movement of crude by tanker from the Persian Gulf to Haifa for the refinery was blocked by the refusal of the Egyptian Government to allow transit of such shipments through the Suez Canal. Recently, it was reported in Cairo that the Egyptian cabinet had decided that tankers using the canal and then heading for Israel instead of the port indicated in their papers would be refused future passage through the canal.

During the latter part of last year, operations at the Haifa refinery were undertaken on a much reduced scale using crude shipped in by Venezuela. This was discontinued after a few months because it was said, of the dollar outlay involved in these uneconomic shipments.

# Aramco's Accounting

## Report to the Saudi Arabs shows what is being done for the country as incidents and adjuncts to oil operations

ARABIAN AMERICAN OIL CO.'s continuing exploration program, its producing and refining activities, and its efforts in such nonindustry fields as railroad construction and malarial control are described in the second of the company's annual reports to the Saudi Arab Government to be made public.

The new report noted the decline in Saudi Arabian crude production from the 532,282-bbl. daily peak in February 1949, and in a foreword, W. F. Moore, Aramco president, called attention to the invasion of traditional American oil markets by British companies as a result of their favored currency position.

"Many countries, in fact, are committed to buy so-called sterling oil as a result of England's bilateral financial and trade agreements," said Moore. "The British, also, through exchange restrictions, refused to allow American companies to sell for sterling. Negotiations to correct these inequities have been under way for some months between the British Government and the American oil companies, the latter being aided by the United States Government."

Moore pointed out that the American companies are demanding the right to sell oil on equal terms with their British competitors but said it is nevertheless clear that substantial changes must be made by the American companies, requiring trading in currencies other than dollars and sterling. Such currencies, he added, must necessarily be used in discharge of its royalty and other obligations.

Despite the unsettling situation in international trade, the report itself reflects further progress by Aramco in many phases of its activities. It also documents a prime example of the way in which a major private-capital development of this kind assists a technically underdeveloped country. The report is published in two parts, one in English and the other giving the same information in Arabic.

Summarized below are some of the highlights of the report which covers last year's operations:

**Production.**—The year's total was 22,820,783,101 tons (about 477,000 bbl. daily). Of oil runs from field storage, 5,863,056 tons went to Bahrein via the pipe line, 6,058,607 tons to the Ras Tanura refinery, and 10,686,410 tons was lifted offshore. During the year, the company produced, saved, and sold, 20,430,000 cu. ft. of gas.

**Drilling.**—A total of 24 wells were completed, 11 of them in Abqaiq. New fields were discovered at Ain Haradh and at Al Fadhili. The Abqaiq deep test, Well No. 2, was taken to 11,209 ft., and drilling was discontinued because of the condition of the hole. It was plugged back and completed in a productive zone at 6,204 ft. Three wells were completed at Ain Haradh, with a fourth drilling at the end of the year. The discovery well at Al Fadhili was completed at 10,675 ft.

**Exploration.** — Exploration was expanded, and the number of parties increased. Mapping surveys were carried out along the coast from the Neutral Zone to the region south of Qatar. Geological and gravity work was in progress in many areas. Structure drill work in the Abu Hadriya-Manifa region was extended into the Persian Gulf where a marine party is now operating. New and improved marine equipment made possible work in water of limited depths away from shoals and islands. Both land and marine seismograph work was carried out.

**Refining.**—Runs at Ras Tanura averaged 126,766 bbl. daily. Products manufactured totaled 43,788,787 bbl. Of this, 10,915,120 bbl. was gasoline, 2,513,878 bbl. kerosine, 11,940,597 bbl. diesel oil, and 18,419,192 bbl. fuel oil.

**Construction.** — Oil-handling facilities completed during the year included looping the Bahrein pipe line from Dhahran to Al Khobar, installation of a fourth 100,000-bbl. trap setting at No. 2 Abqaiq separator plant, and six additional 180,000 bbl. tanks at Ras Tanura. Construction was begun on a new gas-oil separator plant at Buqqa. Work continued on a new stabilizer and attendant facilities at Abqaiq, and a new 500-bbl.-daily asphalt manufacturing plant was started at Ras Tanura. Other construction included a steam electric plant, shop building, railroad yard, clinic, warehouses, a portable hospital, storage buildings, and roads.

**Personnel.**—By last year Aramco had completed much of its long-range expansion program which was started in 1944. This caused a gradual reduction of the employment force. Total manpower was cut from 20,254 at the beginning of the year to 16,048 in December 1949. Of interest was the percentage of nationalities in the manpower force at the end of the year. These were, Saudi Arabs 62.3 per cent, Americans 18.5 per cent, Adenese 5.2 per cent, Italians 4.9 per cent, Indians 3.2 per cent, Sudanese 2.9 per cent, and Pakistanis 2.1 per cent.

**Housing.**—As of the end of the year, the company was housing in all three districts 11,475 employes. Approximately 50 per cent of all employes occupying company housing were located in permanent quarters. Housing construction was intensified during the year, and a total of 72 permanent dormitories were completed to provide for 2,016 employes.

**Industrial development.**—The company's Arab industrial-development department continued to assist Saudi Arabs in a variety of projects. The company let more than 331 contracts to Saudi Arabs, enabling many of them to establish their own businesses. In the training field, the increased number of government elementary schools in the vicinity of the company's operations made it possible for Aramco to concentrate on industrial training of its mature employes. At the end of the year, 24.23 per cent of all Saudi Arab employes were receiving special training.

**Transportation.**—The company had in service at the end of the year a total of 1,863 motor vehicles of all types, including 503 light and 653 medium and heavy trucks. Motor-transportation cargo hauled during the year averaged nearly 150,000 tons a month. In the marine field, general dry cargo arriving at Ras Tanura by freighter exceeded 188,000 tons, including government and railroad imports. Oil tankers calling at Ras Tanura averaged 102 a month. In air transport, the company used 16 aircraft averaging 135 flights a month and flying a total of 1,093,457 air miles during the year.

**Medical.**—During the year, the company's medical staff gave 315,538 outpatient treatments, and cared for 7,640 patients who were hospitalized. Reported malaria cases continued to decline, from 2,101 in 1947 and 1,318 in 1948, to 94 in 1949.

**Services.** — Substantial progress was made in construction of the government's railroad and port project. A total of 108 miles of track had been laid to a point 3 miles west of Hofuf, and new equipment arriving brought the total to 8 diesel-electric locomotives and 173 freight cars in operation. Orders were placed for 1950 delivery of 5 more locomotives, 90 freight cars and 15 passenger-car bodies. The Dammam port was near completion. During the year the company started making plans for a gradual transfer of its participation in agricultural development to the government's new Directorate of Agriculture, which is assisted by the United Nations Food and Agricultural Organization.



XUM

# PERSONALS

## Veteran Executive

### Gibson served 27 years in Iranian oil fields

H. S. GIBSON, who became managing director of Iraq Petroleum Co., Ltd., at the beginning of this year, is one of the most widely recognized operating executives in the British petroleum industry.

Gibson had a record of some 27 years of service with Anglo-Iranian Oil Co., Ltd., nearly all of it in field operations in Iran, before he was appointed to head I.P.C. and its associated companies on the retirement of John Skliros.

During World War I, Gibson served with distinction with the British Army in France, Egypt, Salonica, and Turkey. Following the war, he studied at Cambridge, taking honor examinations in mechanical science in 1922 and proceeding to M.A. in 1930.

He joined the then Anglo-Persian Oil Co., Ltd., in 1922 as production manager. This company was the predecessor of the present Anglo-Iranian. In 1928 he became production superintendent, in 1932 assistant fields manager (production), in 1944 assistant general fields manager (production), and the following year general fields manager. He returned to England in 1949 and was placed in charge of the company's research station at Kirklington Hall in Nottinghamshire.

Gibson was awarded the honor of C.B.E. (Commander of the Order of the British Empire) in 1947. The same year he also received the Redwood Medal of the British Institute of Petroleum for his pioneer work on the control of limestone reservoirs and multistage stabilization of gas. He is the author of several papers on production technology.

**Dr. Dysart E. Holcomb,** research technologist in the project-evaluation group, Sinclair Research Laboratories, Harvey, Ill., is leaving that position to become dean of engineering at Texas Technological College, Lubbock, Tex.

**Maurice A. Brewster,** veteran executive officer of the Pennzoil Co., Oil City, Pa., retired from active service with the company on July 1. He became associated with Penn American Refining Co. as auditor in 1917.

**James Ford,** veteran geological scout for Gulf Oil Corp., has retired, and has been succeeded at Shawnee, Okla., by **T. W. Gilmer,** Ardmore, Okla. **Dick O'Connell,** Oklahoma City, will succeed Gilmer at Ardmore, and **John Remmell,** geophysical scout at Ardmore, will transfer to Oklahoma City.

**Howard H. Jensen,** geologist for Superior Oil Co. at Denver, has moved to Rock Springs, Wyo., as consultant geologist in the Green River Basin area.

**Harley W. Covington,** station engineer for Service Pipe Line Co. (formerly Stanolind) at Kirby, Wyo., has been transferred to El Reno, Okla., where the company recently reopened its station. Also assigned at El Reno are: **Lee M. Harmon,** station engineer, transferring from Elmont, Kans.; **Joel B. Fields,** station engineer, transferring from Maud, Okla.; and **Clyde H. Ballard,** transferring from Cushing, Okla. **C. J. Driver** and **W. R. Eubanks,** both of Fairbanks, Tex., and **Sam Anthony** and **L. K. McClure,** both of Bowie, Tex., have all been transferred to the newly opened Childress, Tex., station as engineers. **J. J. Peard** is chief station engineer at El Reno, with **Austin J. Moss** serving as relief engineer. **A. M. Whitewell** is chief engineer at Childress, and **D. S. Raney** is relief engineer. Both Moss and Raney formerly were stationed at Ranger, Tex. Other changes, all transfers from Humbolt to Wichita, Kans., include: **C. A. Childers,** manager, Kansas Division; **Ross Lewallen,** foreman; **Kenneth H. Bowman** and **Clifford O. Nielson,** engineers. **Clarke A. Clay,** formerly of Stafford, Kans., was moved to Wichita as office manager.

**T. S. Zajac,** corrosion engineer for Shell Oil Co., Houston, has been elected chairman of the Natural Gasoline Association of America's corrosion-research project committee, succeeding **W. H. Stewart,** Sun Oil Co., Beaumont, Tex. **F. A. Prange,** chief metallurgist for Phillips Petroleum Co., Bartlesville, Okla., was named vice chairman of the committee. Other members include: **T. S. Bacon,** Lone Star Producing Co., Dallas; **H. E. Waldrip,** Gulf Oil Corp., Houston; and **P. P. Spafford,** Stanolind Oil & Gas Co., Houston.

**Joseph Coates,** widely known senior geologist of the Burmah Oil Co., Ltd., left India in June to return to England preparatory to retirement. Coates, whose headquarters has been in New Delhi, has been associated with B.O.C. for more than 25 years. From 1929 to 1938, he was occupied almost entirely with development of the Burma fields where he carried out many separate investigations into newly developed techniques such as gas injection. In recent years Coates has been engaged in a largely supervisory capacity in connection with the company's exploration program in India and Burma.

**K. C. Heald,** vice president of Gulf Oil Corp., has been elected a director of the company. He fills the vacancy resulting from the retirement July 1 of **E. C. Bothwell** as a director and vice president. Heald resigned as associate professor of geology at Yale in 1925 to become chief staff geologist of the Gulf companies. Early last year he was made responsible for the company's exploration and production in the United States and Canada, and

*E. C. BOTHWELL*

*K. C. HEALD*

with his latest advancement, he takes charge of all exploration and production activities of the company. Bothwell has served with the company since 1915. **Rush Greenslade,** vice president and general manager of Gulf's Tulsa division, will retire on August 1, and will be succeeded by **Phil H. Bohart,** who was recently elected a vice president of the company. Greenslade joined Gulf in 1914, and has served as vice president of Gulf Oil & Refining Co. since 1936. Bohart has been with the Gulf organization since 1919.



XUM

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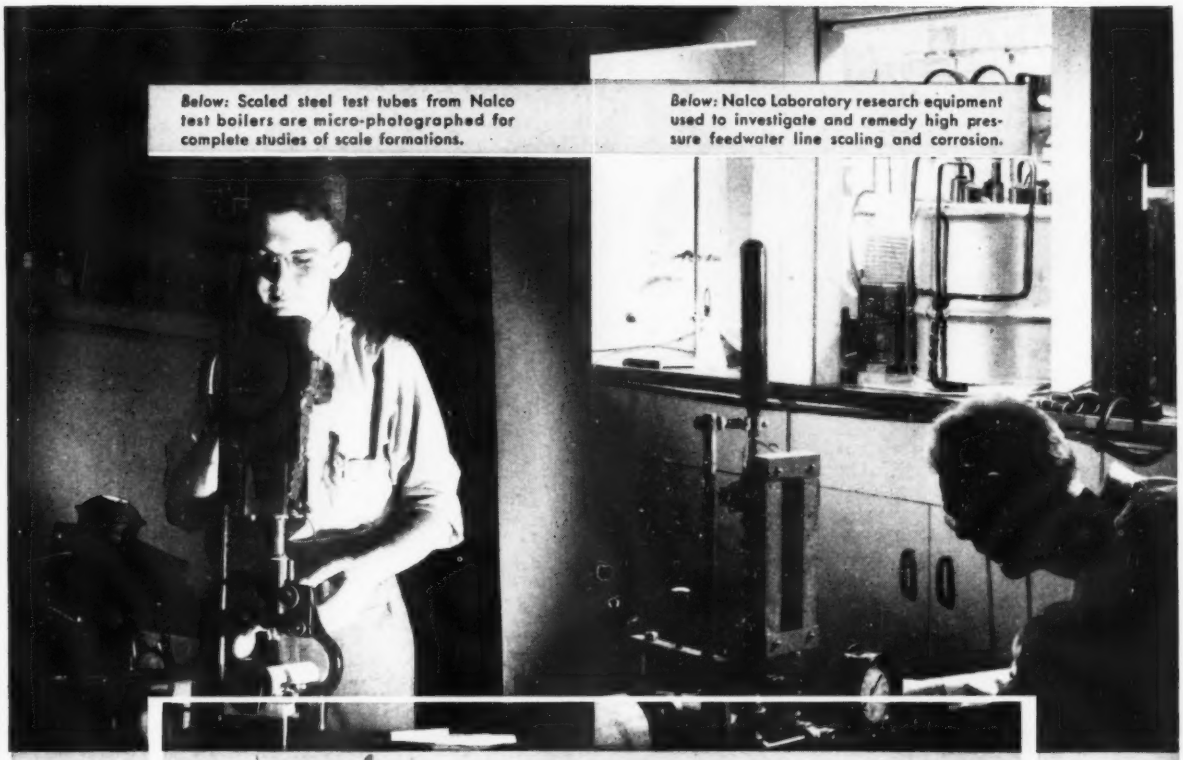

*Below:* Scaled steel test tubes from Nalco test boilers are micro-photographed for complete studies of scale formations.

*Below:* Nalco Laboratory research equipment used to investigate and remedy high pressure feedwater line scaling and corrosion.

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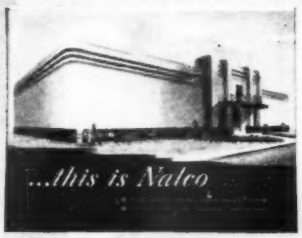


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# PERSONALS

**Charles F. Fogarty,** geologist in Colombia for Socony-Vacuum Oil Co., Inc., is one of four employes of foreign affiliations who have been selected to receive company fellowships for additional study in the United States. Others include: **R. G. Knabe,** subsurface geologist in Venezuela, who, with Fogarty, will study for a master's degrees in geology; **L. E. Twining,** geophysical computer in Egypt who will study for a master's degree in geophysics; and **J. A. Wallace,** geologist in Canada, who will continue graduate work in geology at Stanford University. The fellowships, together with scholarships recently awarded to seven universities, are part of a $200,000 4-year educational project instituted by Socony-Vacuum's producing department last year.

**Walter J. Levy,** New York economic consultant who several months ago was appointed special adviser to the Venezuelan Government in connection with its royalty-oil price negotiations, has been named general economic consultant on petroleum matters to the Venezuelan Government for the 1950-51 fiscal year.

**E. J. McClanahan** has been elected to the board of directors of Standard Oil Co. of California. Joining the company in 1912, he has been a vice president since 1943, specializing in marketing activities.

**J. C. Richdale,** manager of Esso Standard Oil Co.'s New England division, has been appointed assistant to the president, with headquarters in Boston. He has been with the company more than 20 years.

**W. E. Ferguson** has been appointed manager of production for Ohio Fuel Gas Co., Columbus, where he has been assistant manager since 1944. Ferguson started as a draftsman for the Logan Gas Co. in 1917, and in 1924 was made chief engineer. Following merger with Ohio Fuel he became assistant chief engineer. In 1930 he was appointed superintendent of the lease and engineering departments, which position he held until he was named assistant manager of production.

**Gail F. Moulton,** staff geologist in the petroleum department, Chase National Bank, New York City, has been elected second vice president of the bank.

**Vicente Suarez** has been appointed director of the Geological Bureau of the Colombian Ministry of Petroleum succeeding **Roberto Sarmiento** who was recently named a member of the government's National Petroleum Council.

**Victor Hourcq,** chief geologist of Soc. des Petroles d'Afrique Equatoriale Francaise and Soc. des Petroles de Madagascar and assistant manager of the French Petroleum Research Bureau in Paris, has been visiting oil field installations in Colombia, Venezuela, and Brazil. He is due to return to Paris late in July after trips to Ecuador, Peru, and the Gulf Coast. The two French companies he represents are now engaged in exploration work, including two current wildcats in French West Africa.

*OTIS B. HOCKER*

*B. H. TREYBIG, JR.*

**Otis B. Hocker** has been named assistant manager of the geophysical division, producing department, The Texas Co., Houston, and **B. H. Treybig, Jr.,** has been named assistant to Division Manager **R. L. Lay.** Hocker is a graduate of Texas A. & M. College, and joined Texaco in 1935 as a seismic computer. He has seen service in Egypt, and has had wide experience in various areas in the United States. He went to Houston in March 1948 as supervisor of field operations, and last year was appointed geophysicist on the general manager's staff. Treybig, who attended Rice Institute, joined the firm in 1932. He has seen service in Venezuela and Canada, as well as in various areas in this country. Since 1944 he has been supervisor of geophysical operations, Louisiana division.

**O. G. McClain,** consulting geologist, has been elected president of the Corpus Christi Geological Society for the 1950-51 term. Other new officers are: **W. M. Chaddick, Jr.,** Sun Oil Co., vice president; **J. C. Meacham,** Humble Oil & Refining Co., secretary; **Richard N. Spencer,** Union Oil Co. of California, treasurer; and **C. C. Miller,** Renwar Oil Corp., and **Joe Gierhard,** consulting geologist, both executive committeemen.

**Ebb White,** district superintendent of production at Midland for Seaboard Oil Co. of Delaware, has been made assistant manager of production and transferred to the company's Dallas office. White succeeds **G. R. Brainard, Jr.,** who has resigned to become associated with Niles Oil Co., Dallas. **F. M. Loop,** assistant superintendent of production at Midland, has been named district superintendent of production, and **Cecil Matthews,** district petroleum engineer, has assumed the

*FOREIGN VISITORS.—Foreign guests who attended the recent Los Angeles Chapter of Nomads meeting are shown above. Seated, left to right: R. E. Lorenz and John E. Sligh, Iraq Petroleum Co., Ltd.; E. N. Mitchell, Philippine Oil Development Co.; Eugene L. Davis, Arctic Contractors; C. E. Bickerdike, William Kenyon & Sons, Ltd. Standing, left to right: Walt L. Sears, Iraq Petroleum Co., Ltd.; Karl L. VonderAhe, Arctic Contractors; L. E. Miles, I.P.C.; David L. Cantway, Mene Grande Oil Co.; and J. D. Bryan, Superior Pipe Service.*



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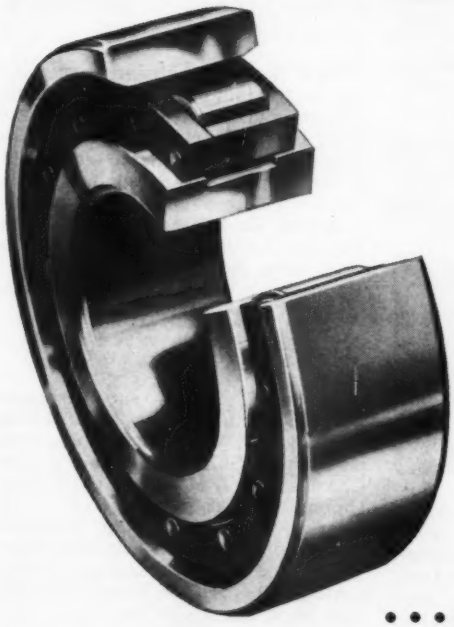

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# ROLLWAY BEARINGS

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# PERSONALS

duties of assistant district superintendent of production.

**J. A. Cleverley,** Bartlesville, Okla., has been appointed assistant general superintendent of the oil-production division of Cities Service Oil Co. (Del.). He has been with the company for 30 years, and is a graduate of Rensselaer Polytechnic Institute, New York. Cleverley joined Cities Service as a junior engineer at Bartlesville shortly after serving in the Navy in World War I. In 1924 he was assigned to the engineering department, and in 1926 was transferred to El Dorado, Kans., as production engineer. He held various positions in southern Kansas, and in 1945 was named in charge of the Oklahoma City district, where he served until 1948, when he was transferred to Bartlesville.

**F. C. Anderson,** accounting adviser; **E. E. Merkt, Jr.,** technical adviser; and **K. E. Rotegard,** economic adviser to the vice president, have been named to fill those newly created positions in the executive department of Gulf Oil Corp.'s Fort Worth division. **B. E. Thompson,** formerly assistant superintendent of production, has been named production supervisor; **C. D. Cordry,** formerly chief zone geologist, has been made division geological supervisor; **H. M. Craig,** formerly assistant to the general agent, has been named division administrative supervisor; **M. I. Taylor,** formerly assistant chief petroleum engineer, has been made division petroleum engineer. In addition, new titles have been set up for the following: **W. M. Lourcey,** division land supervisor; **T. W. Rhoads,** division gas and gasoline supervisor; **T. J. Dwyer,** division civil engineering supervisor; **C. S. Youngblood,** division purchasing supervisor; **W. F. Rankin,** division traffic and transportation supervisor, and **T. E. Vandiver,** division safety supervisor.

**John W. Payne** has been made technical director of the development division, research and development laboratories, Socony-Vacuum Oil Co., Inc., Paulsboro, N. J. He received his B.S. degree in chemical engineering from Yale University in 1930, and joined Socony-Vacuum in 1931. **H. P. Caldwell** has been made supervisor of the refining section of the laboratories. He joined General Petroleum Corp., Socony affiliate, in 1934, after receiving his B.S. degree in chemical engineering from Purdue University. He has been in the Socony-Vacuum laboratories since 1936.

**James E. Adams,** foreman of the Southern division's gas-testing and meter department for Signal Oil & Gas Co., was elected president of the Southern California Meter Association at its recent monthly meeting. He succeeds **R. F. Fields** of Southern California Gas Co. **H. C. Bennett** of Southern California Edison Co. was elected vice president; **G. H. Forster** of The Texas Co. was renamed as secretary-treasurer; and **R. D. Pomeroy,** Southern California Gas, was chosen as auditor.

**J. Calvin Brown,** consulting mechanical engineer and patent attorney of Los Angeles, last week was nominated as 1951 president of American Society of Mechanical Engineers. As only one name is presented, nomination is tantamount to election.

**A. J. Herron,** refinery manager and director of Bitumen & Oil Refineries (Australia), Ltd., has taken up duties of manager of Caltex Refineries (Japan), Ltd., and consultant and advisor to the Japanese oil refiners who will process crude for Caltex Oil (Japan), Ltd. Herron returned to Dallas last November following a 3½-year assignment in Australia as refinery manager and director of Bitumen & Oil Refineries. Prior to that he spent 18 months on Bahrein Island in the Persian Gulf, as assistant refinery superintendent for Bahrein Petroleum Co. From 1930 to 1944 he was assistant superintendent of The Texas Co.'s West Dallas refinery. He has been with Texaco and California Texas Oil Co., Ltd., for 30 years.

**Thomas G. Rabbitt** has been appointed assistant general traffic manager of Sun Oil Co., Philadelphia, and **Richard C. Harvey** and **Lee A. Christianson** were named assistant traffic managers. Christianson formerly was on loan by Sun to Mid-Valley Pipeline Co. as traffic manager.

**George A. Musselman,** geologist for Carter Oil Co., Tulsa, has resigned to become a farmer and rancher in Southwest Texas. He joined the company in 1936.

**Charles D. Fenstermaker,** Shreveport geologist, has joined the geological staff of Stanolind Oil & Gas Co., with headquarters in Oklahoma City.

**Charles E. Bennett,** president of Manufacturers Light & Heat Co., Pittsburgh, has been appointed chairman of the program committee for the 1950 fall meeting of the Natural Gas Department of the American Gas Association, which will be held in Atlantic City in October.

**John N. Berg,** division geologist for Pure Oil Co. at Fort Worth, has resigned to join Superior Oil Co. of California at Houston.

**W. Orville Wall,** general production superintendent at Edmonton, Alta., Canada, for British American Oil Co., Ltd., has been elected first permanent president of the Edmonton Petroleum Club.

**Pete Gardett** has been named acting exploration manager for the Rocky Mountain division of General Petroleum Corp. He replaces **Victor King,** who is being transferred temporarily to the Los Angeles headquarters.

**Arthur G. Sullivan, Jr.,** petroleum engineer for Ohio Oil Co. at Henderson, Tex., has been transferred to Haynesville, La., in the same capacity.

## SHIFTS

**Ernest F. Lewis,** superintendent, Union Sulphur Co., Inc., Iowa to Lake Charles, La.; **W. D. Smith, Jr.,** engineer, Union Sulphur, Sulphur to Lake Charles, La.; **J. M. Whatley,** geologist, Union Sulphur, Sulphur to Lake Charles, La.; **J. L. Tatu,** geologist, Fayetteville, Ark., to Durango, Colo.; **Tyler A. Ferguson,** engineer, Transcontinental Gas Pipe Line Corp., College Park, Ga., to Dallas.

# DEATHS

**Frank A. Gillespie,** 82, former Tulsa oil operator, died July 4 in Santa Monica, Calif. Gillespie started in the oil business in Pennsylvania, and moved to Tulsa in 1906, where he developed production in the Glenn Pool field. He retired from the oil industry in 1920.

**M. L. (Hap) Massingill,** 63, San Antonio oil man, was killed in an airplane crash at Eldorado, Tex., June 29.

**James Joseph Moroney,** 82, Okmulgee, Okla., oil man, died June 30.

**Harry T. Wolfe,** 75, Bristow, Okla., oil producer, died July 1.

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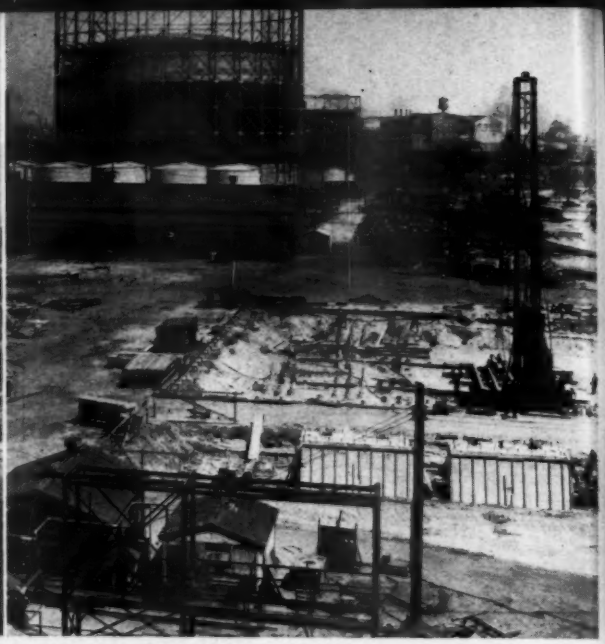
*1. SINCLAIR STARTS.—Expansion project at East Chicago refinery gets under way, with grading machines commencing clearing out for foundations.*

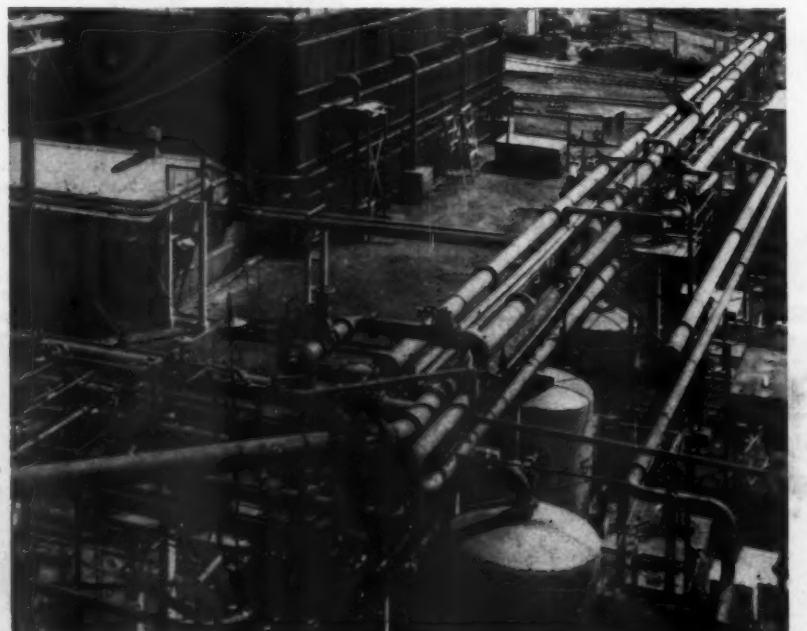


*2. FOUNDATIONS POURED.—The sequence photographic record here has permanently preserved what construction project looked like at this step.*

# PHOTOGRAPHY PROVES VALUABLE TOOAT

**by R. D. Herlocker**

**Photos can give a valuable "assist" in construction and engineering work. And when taken in sequence form, they make a permanent record of "what happened," step by step. This article tells how one large oil company uses photography.**



*5. PLANNING CHANGES?—Photographs such as this one of old piping are valuable when analyzing best possibilities for rearranging or relocating piping systems.*

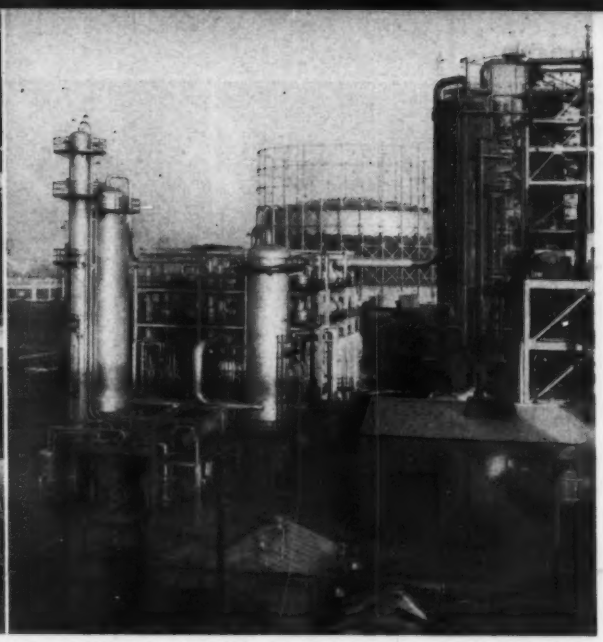
PHOTOGRAPHY is not often considered as being closely related to oil-refinery operations, but it has proved to be a valuable tool at Sinclair's East Chicago refinery, saving time and money, as well as performing some jobs which could be done in no other manner.

### Use in New Construction Work

One of the more obvious uses for photograph in an oil refinery, or in any industrial plant, is as a part of the record of new construction. During the recent expansion program at Sinclair Refining Co.'s East Chicago plant, progress of all major construction was followed by means of photographs taken at regular intervals, usually weekly, and at completion. The photographic record comprised nearly a thousand pictures. These traced the construction of a new catalytic cracking unit, crude still, straightrun fractionation and treating facilities, high-pressure polymerization unit, lube-refining units, and boiler-house extension from ground breaking to completion.

Figs. 1 to 4, inclusive, taken during construction of the Sinclair catalytic cracking unit, are representative of construction photography. All were taken from the same location. Together with similar pictures taken from other viewpoints around the unit, they show clearly the progress of the job at any given time. The use of this pictorial record has greatly lessened the amount of descriptive material which had to be written for progress reports, and at times pro-

*3. ERECTION WORK.—Here the new plant facilities begin to appear "grown up." Photo shows much steelwork in place, and what rigging equipment was used.*



*4. FINISHED JOB.—Here the camera looks at the final, ready-to-go-on stream cat cracker facilities. All photos were taken from same location.*

# OAT SINCLAIR'S EAST CHICAGO REFINERY

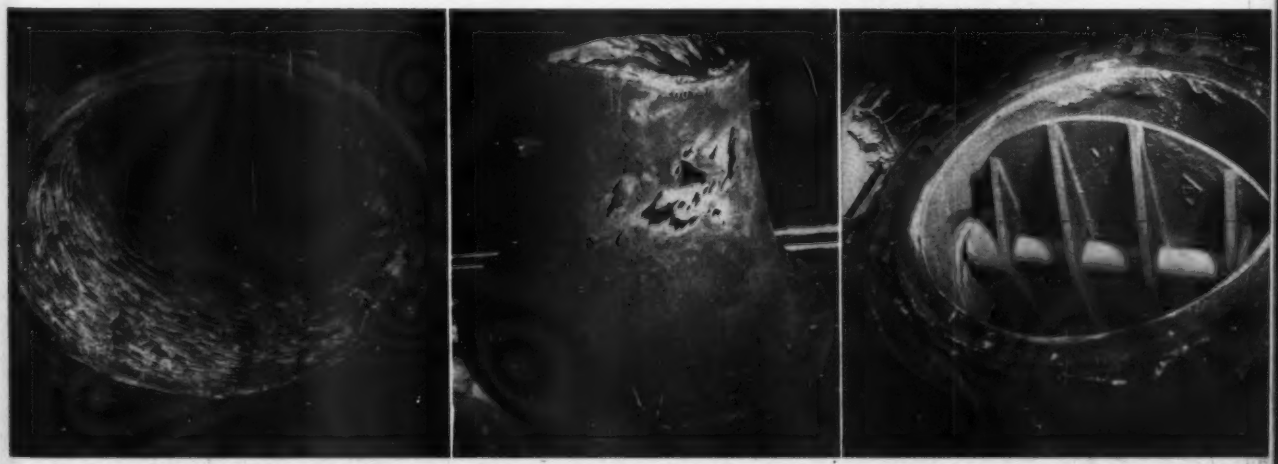
vided a clearer description of the work than any number of words could have done.

### Photos Aid in Alterations

A closely related, but less obvious, use of photographs in connection with construction work occurred when it became necessary to relocate several overhead pipe lines carrying steam, air, and refinery gases, in order to make room for new equipment. These lines were in an older section of the refinery, and over the years, many field alterations had been made as operations changed.

The alterations were not always accompanied by corresponding changes in the engineering drawings, so that when the lines were to be moved, there was little relationship between the drawings and the actual installation. It would have been quite an extensive, and expensive, job to bring the old drawings up to date before detailing the relocations, so photographs, of which Fig. 5 is a sample, were taken, showing in detail all of the lines involved. By using these to supplement the old drawings, it became relatively simple to plan the new piping.

Sinclair's refinery inspection department makes use of photography very extensively to provide a pictorial record of equipment failures, and of wear and erosion conditions. Formerly, when an unusual failure or erosion condition showed up, a section of the piece involved was cut out and saved for study. Such sampling was necessarily quite limited, because of the weight and bulk of such samples and, of course, it was impossible if the part were to be kept in service. Photographs have now largely replaced these samples, providing a record which is much more complete. It is



*6, 7. LEFT AND CENTER PHOTOS.—Inner and outer views of a cyclone section which failed from erosion. These pictures provide a permanent and convenient record of such equipment failures. 8. RIGHT PHOTO.—Good picture of details of erosion around shaft of butterfly valve. This picture is the only possible visual record of the erosion, since the valve was repaired and returned to service.*



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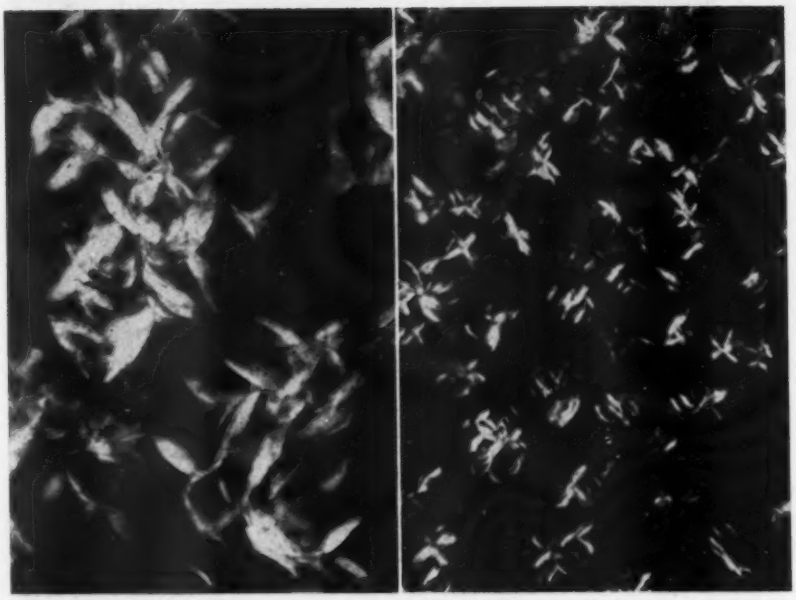


*9, 10. PHOTOMICROGRAPHS.—Paraffin distillate samples under the microscope. At left is a distillate with well formed wax crystals which will process easily. Shown at right is a distillate with microcrystalline wax structure apparent, which will cause trouble in wax finishing.*

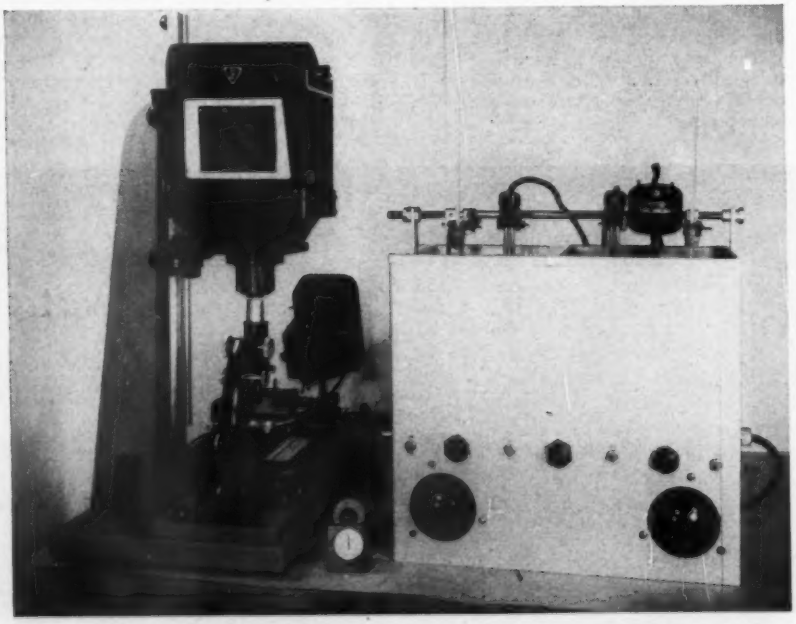
**R. D. Herlocker has been in charge of additive manufacturing, Sinclair Refining Co., East Chicago, Ind., since 1945. Herlocker received his B.S. degree in chemistry from Knox College in 1932. After a year of graduate study at University of Illinois, he came to Sinclair Refining at East Chicago. Twelve years were spent in the research and development department, where he took time out from work on lube-oil additives to organize the department of photographic laboratory.**

also more readily available, in that copies may easily be sent to interested parties, as for example, to the equipment suppliers in case of complaints.

Figs. 6, 7, and 8 are representative of the inspection photographs. Inner and outer views of a cyclone section which failed from erosion are shown in Figs. 6 and 7. Since the section photographed is some 4 ft. long and weighs several hundred pounds, keeping it as a sample would be impractical, and the photographs describe its condition better than several hundred words could do. Fig. 8 shows an eroded butterfly valve, which was repaired and returned to service. Here the photograph provides the only possible record of its condition.

Photographs are used by the refinery safety department for accident reports, to show the conditions under which an accident occurred, such as hazardous circumstances, presence or absence of proper warning signs, safety and protective equipment, etc. Similarly, situations which might result in legal liabilities are photographed whenever found, so that a permanent record is kept, whether or not the situation is under refinery control.

As an example of this type of work, photographs were taken of an oil scum found on the surface of the shipping canal adjacent to the refinery boundaries. Because of legal pressure on industries of the district to clean up all wastes before discharging them, these photographs provide valuable assistance in establishing that the refinery was not responsible for the condition.



*11. WAX PHOTOMICROGRAPHY SETUP.—Shows temperature control equipment. Jacketed cell on microscope stage holds sample. Water is circulated from the bath at right to maintain the desired temperature.*

### Photomicrographs of Products

Photomicrography is used regularly for control of operations on the stills making paraffin distillate. The stills are run to get the maximum yield of distillate with proper wax characteristics. Too deep a cut into the stock causes microcrystalline wax to appear in the distillate, interfering with normal wax-finishing operations. Therefore, daily samples of the paraffin distillate are photographed through the microscope to determine the crystal structure of the wax present.

Fig. 9 is a photomicrograph of a sample of a good paraffin distillate, while that shown in Fig. 10 contains enough microcrystalline wax to interfere with dewaxing operations. The use of these photomicrographs has made possible a reduction in the amount of microcrystalline wax which gets into the paraffin distillate.

Photomicrographs are also used for recording the results of bearing tests on heavy-duty lube oils and greases. A good photomicrograph will give more information as to the amount of wear and scoring of the test bearing than an extensive description.

*(Continued on page 57)*

# DRILLING DEVELOPMENT in Sussex Area Johnson County, Wyoming

by E. Y. Long

TAYLOR - SUSSEX UNIT, in 42n-78 and 79w, Johnson County, Wyoming, was formed early in 1948, after seismograph work had confirmed evidences of structure shown by surface geology and gravity - meter surveys. The unit area, shown on the map (Fig. 1) encompasses approximately 13,376 acres of federal, state, and fee lands, of which 12,621 acres are held by Continental Oil Co. The remainder of 755 acres is not committed to the unit.

The discovery well was completed in July 1948 and initially produced 241 bbl. of 41°-gravity sweet green oil in 24 hours flowing through a ¼-in. choke. Total depth was 7,726 ft. in the Lakota sand. Top of the sand was 7,683 ft. This well was drilled on the most promising of several small seismograph highs in the unit. The No. 2 well, ¼ mile east of the discovery, found the Lakota sand 192 ft. lower than No. 1 and failed to produce from the poorly developed sand. Wells Nos. 3, 9, and 12 were subsequently drilled west of No. 1 and were completed as Lakota producers. No. 19, a half-mile step-out to the northwest, is now drilling with the Lakota sand as its objective.

**Earl Y. Long has been district petroleum engineer for Continental Oil Co. at Lance Creek since June of 1947. Long was born in Cleburne, Tex., in 1912. He was graduated, with a B.S. in mechanical engineering, by Texas A. and M. College in 1936. From 1936-41 he worked for Continental Supply Co. as sales engineer in Oklahoma, Kansas, and Illinois. Then, after 5 years' service in the U. S. Army during World War II, he joined Continental Oil in November 1946. Paper presented at Rocky Mountain district of American Petroleum Institute, Division of Production, Casper, Wyo.**

During the drilling of the first three wells, the Lakota appeared to be the only productive horizon in the unit, drill-stem tests in the shallower Shannon and Wall Creek sands (both productive at Salt Creek) having been disappointing; however, in No. 4, a diagonal northwest 40-acre offset to No. 3 in the west area, a "stray" sand at 4,070 ft. was cored, showed saturation, and made gas and 200 ft. ft. of 40°-gravity oil on a drill-stem test. Later, at 4,550 ft., the Shannon sand was cored and, on drill-stem test, made 3,300 ft. of oil in 4½-in. drill pipe in 40 minutes.

This development was doubly fortunate as No. 4 ran low and encountered water in the Lakota sand at 7,787 ft. Casing was run through the Wall Creek, perforated in that formation, and the sand tested with a packer. Since only 1,400 ft. of water were recovered, the Wall Creek was squeezed with cement and the well plugged back to, and perforated in, the Shannon sand.

After swabbing and acidization, the well was completed as a 250-bbl. per day Shannon producer. It was necessary to pump this well. Later, No. 7, an east offset to the Shannon well, was also dry in the Lakota and completed in the Shannon as a 175-bbl. per day pumper. Tests of the unnamed sand above the Shannon indicated it to be productive in this well also, and at this time it was decided to call it the "Sussex sand."

A dry hole drilled on acreage not committed to the unit in SE SE SE 18-42n-78w, shows that the productive area cannot extend far to the south.

The group of wells mentioned so far are in what is known as the "A" area.

### Lakota 'B" Participating Area

Well No. 5 was drilled on another seismograph high and discovered oil in the Lakota sand in the "B" area. This well, which is located in SE SW NE 23-42n-78w, was completed in

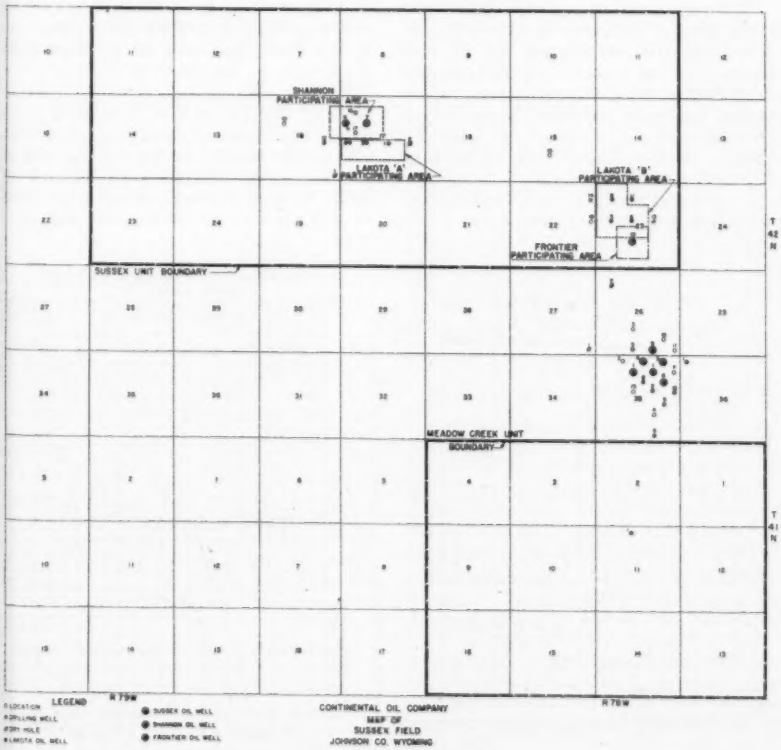



*Fig. 1*



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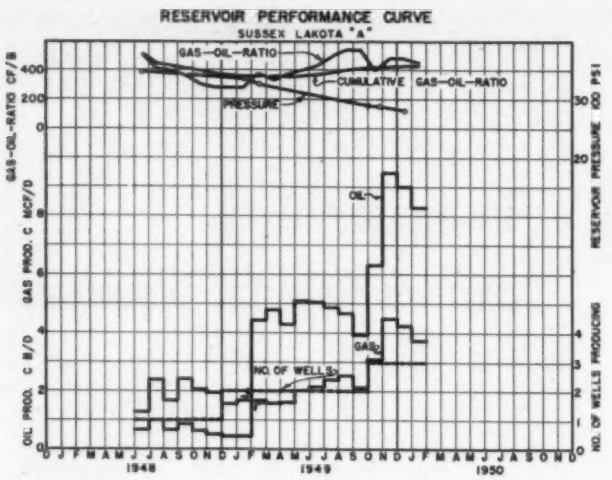



*Fig. 2*

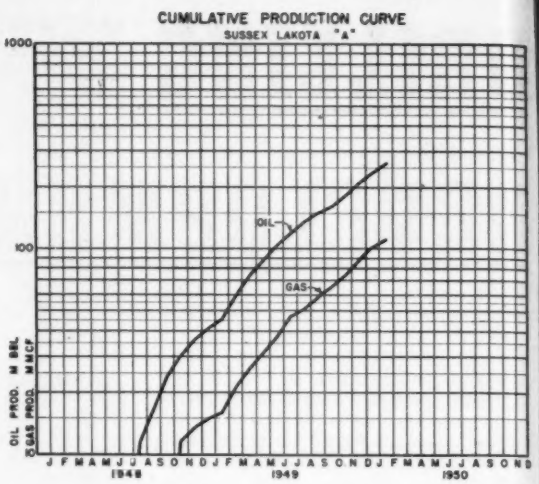



*Fig. 3*

May 1949 with an initial potential of 565 bbl. of oil daily, calculated from productivity index data

Wells numbered 6, 8, 11, 13, and 14 have since been completed as producers in "B" Lakota. An exploratory Lakota test is being drilled in SE SE SW 15, approximately ¾ mile northwest of proven production in the "B" area. No. 10, a 40-acre south extension, found the sand 206 ft. lower structurally than the discovery well, and cores indicated that the formation might carry water. It was found to be impossible to get a drill-stem test because of hole conditions, and 7-in. casing was set on top of the sand.

On a swabbing test, this well produced slightly salty water at the rate of 15 bbl. per hour with fluid level of 3,700 ft. in the 7,610-ft. hole.

The electric log indicated possible production in the first Wall Creek (Frontier) sand at 6,375 to 6,409 ft. and, after squeezing the Lakota, operators perforated opposite this horizon. The formation had apparently taken considerable drilling fluid and cleanup was quite slow. At the same time, well No. 11 was coring the first Wall Creek, and the cores were found to contain from 17 to 27 per cent by weight of acid-soluble materials. No. 10 was, therefore, acidized with 3,000 gal. of mud acid. It was then completed for an initial flowing production of 6 bbl. per hour of 40.5°-gravity sweet oil, thus discovering the fourth productive horizon within the unit. Later, because paraffin and a slight water cut hampered natural flow, the well was put on the pump.

### North Meadow Creek Area

In late November 1949, Delhi Oil Corp. spudded an exploratory test in SE NW NE 35, 1½ miles south of the Sussex "B" area. This well is on federal land, but not committed to any unit. The Sussex sand was encountered at 3,923 ft., Shannon at 4,439 ft., and the well was bottomed at 4,513 ft. Casing was set below the Shannon sand; and since cores and drill-stem tests had indicated the Sussex to be the more promising sand, the well was completed through perforations opposite that formation. Initial production was approximately 400 bbl. per day of 40.5°-gravity green oil.

Thus, 17 months after the discovery in the Lakota, the third productive area, the first outside the Sussex Unit, was proven. It is now referred to as the North Meadow Creek area. Development there has been rapid, and on April 1 there were 8 rigs in operation and 13 Sussex sand wells had been completed.

Although no dry holes have yet been drilled at North Meadow Creek, 2 Federal-Hill, in SE SW NE 35, was carried to the Lakota where it tested water. The Wall Creek is now being tested at this location. Acreage in the immediate vicinity is held by Delhi, Mimi, Murchison, American Liberty, and Continental.

Two miles south of the Taylor-Sussex Unit boundary, Continental holds the Meadow Creek Federal Unit, containing 12 sections in the northeast portion of 41n-78w.

On December 29, 1949, an exploratory well was spudded in NE NE NW 11. Although the Sussex sand was encountered 260 ft. higher than in the highest well at North Meadow Creek, only mud and water were recovered on a drill-stem test. The Shannon yielded a good blow of gas and 230 ft. of green oil when drill-stem tested. The Second Wall Creek, approximately 400 ft. below the First, tested 1,350 ft. of oil and 1,350 ft. of water in the upper part, and 1,635 ft. of water with a scum of oil from the lower. This horizon is now considered to be potentially productive, and thus becomes the fifth zone of distinct geologic age to be proven.

Coring and a series of drill-stem tests of the Lakota in this well indicated it to be productive, but also showed probable water in the lower portion. The Lakota was topped at 7,470 ft., and the hole carried to 7,555 ft. Casing was set on bottom and per-

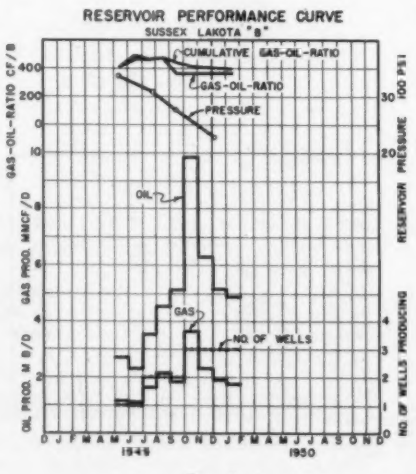



*Fig. 4*

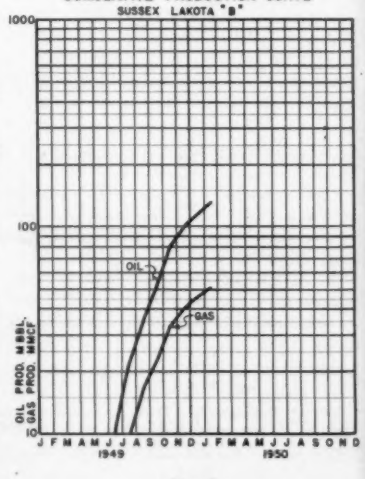



*Fig. 5*

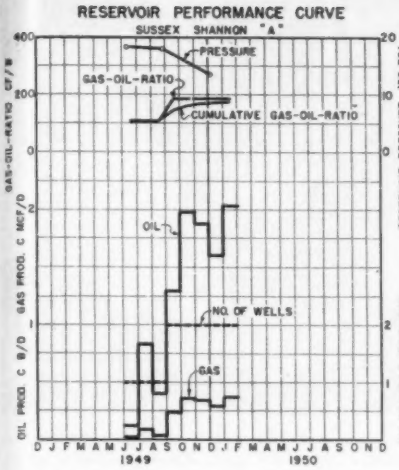



*Fig. 6*

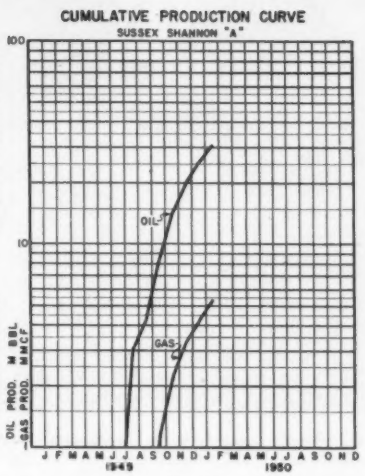



*Fig. 7*

forated from 7,504 to 7,530 ft. Within packer set above this zone, the tubing was swabbed practically dry and 82 bbl. of crude were pumped into the formation with a maximum pressure of 2,450 lb. In 11 hours, the well produced, by swabbing, 140 bbl. of oil, after which the first bench of the Lakota was perforated from 7,475 to 7,490 ft. The latter apparently contributed considerable gas and some oil, and the well was finally completed for 8 bbl. of oil per hour, cut 3 per cent with b.s., no water. Flowing tubing pressure was 725 lb. With the Meadow Creek discovery, there are now 4 separate producing areas and 5 productive horizons, with a total of 10 apparently separate oil accumulations in the Sussex - Meadow Creek area.

### Rigs; Wells; Production

On April 1, in the general area, there were 14 rigs in operation and 30 completed wells, of which 4 were dry. Average estimated daily production was 2,300 bbl.

Cumulative production, as of April 1, from within the Sussex Unit area was 467,703 bbl.

### Geology

There is no surface indication of structural closure in the Sussex-Meadow Creek area. The Lance formation, of Upper Cretaceous age, lies on the surface; and the widening of this outcrop in the general area led to the gravity meter and seismograph investigations. The general structure is a plateau on the northeast side of the Salt Creek uplift Within the bounds of the plateau are scattered accumulations of oil and gas in the Cretaceous sandstones previously referred to.

Since the three Lakota discoveries were each drilled to test closures indicated by seismograph records, it appears that whatever the nature of the traps in this horizon, a seismograph "high" is a good prospect for Lakota oil. Seven tests have been dry the Lakota in the immediate area, one of them a direct offset to the discovery well in the "A" area and one a diagonal offset to the first producer in the "B" area.

Correlation is complicated by the presence of numerous faults and all sands are gradational, varying widely in porosity, permeability, and thickness. Subsurface information to date is not sufficient to determine clearly the character of the trapping, but it is believed that there will be more than one type. For example, the accumulations in the Sussex sand show little or no direct relationship to structural features revealed by the seismograph.

Formations encountered in the area, with their approximate thickness, are as follows:

| Age and formation— | Thickness ft. |
|---|---|
| Upper Cret., Lance | 2,500 |
| Upper Cret., Lewis | 550 |
| Upper Cret., Mesa Verde | 700 |
| Upper Cret., Steel shale | 2,430 |
| Upper Cret., Sussex sand | 40 |
| Upper Cret., Shannon sand | 40 |
| Upper Cret., Niobrara | 440 |
| Upper Cret., Frontier | 760 |
| Upper Cret., First Wall Creek | 70 |
| Upper Cret., Second Wall Creek | 80 |
| Upper Cret., Thermopolis shale | 480 |
| Lower Cret., Dakota | 100 |
| Lower Cret., Lakota | 40 |
| Jurassic, Morrison | 270 |
| Jurassic, Sundance | 250 |

### Production and Drilling Practices

All wells are drilled and completed with conventional rotary equipment. Except at isolated locations, produced gas is used as fuel, although some contractors are using diesel fuel at their option, pending conversion of their prime movers.

**Surface casing.**—In Lakota wells for example, 10¾-in. surface casing is set at approximately 350 ft. and cemented to the surface. Surface casing is set deeper, if protection is required for water sands which may produce nearby. Nine-inch hole is carried to total depth, requiring an average of 48 bits.

**Mud practice.** — After considerable experimentation with various chemical additives and other materials, operators now use straight bentonite-water drilling fluid. Holes stand up well and water loss is maintained within reasonable limits without the use of additives.

There is a very noticeable relationship between mud viscosity and rate of penetration. Viscosity is now maintained, if possible, between 30 and 32 seconds A.P.I., this being the value considered to result in maximum rate of penetration with optimum hole protection.

Contractors generally use between ten and fifteen 6¼-in. drill collars, carrying between 30,000 and 35,000 lb. weight on the bit. All drill pipe is kept in tension while drilling.

All possibly productive sands are cored, and, if found promising, they are also drill-stem tested. Conventional core barrels are used, and an average of three coreheads are required per well.

Ample ground water is available for all purposes at depths ranging from 400 to 600 ft. The water is potable and has no objectionable chemical qualities. At some stages in drilling, it is necessary to furnish over 1,000 bbl. of water per day to a rig; however, this is justified by the improved drilling rate.

Seven-inch o.d. casing is set on top of the Lakota sand unless there is evidence of bottom water, in which case additional hole is drilled into the Morrison shale and the pipe set through.

**Cementing.**—When Wall Creek is believed to carry oil, scratchers are run at 15-ft. intervals from approximately 6,300 ft. (150 ft. above the Wall Creek) to bottom, 7,600 ft. Centralizers are run at 90-ft. intervals wherever scratchers are used. Pipe is worked approximately 16 ft. during the time cement is being pumped. Scratchers are used on the bottom 500 ft., if there are no Wall Creek prospects.

When the Sussex and/or Shannon are oil bearing, Lakota wells are stage-cemented, using either 500 or 700 sacks through the shoe (depending on whether it is desired to cover the Wall Creek) and 300 sacks through the stage collar. Centralizers are used opposite the upper pays; but since the pipe cannot be moved after the collar is opened, no scratchers are used. Below the collar, scratchers are used as previously described.

Surface pipe is allowed to set 48 hours and oil string 36.

Actual fillup with cement behind the casing is approximately 45 per cent of the footage calculated, assuming hole size equal to bit size. The fillup does, however, check closely with the amount calculated, using actual hole size as indicated by the caliper logs that have been made on two wells.

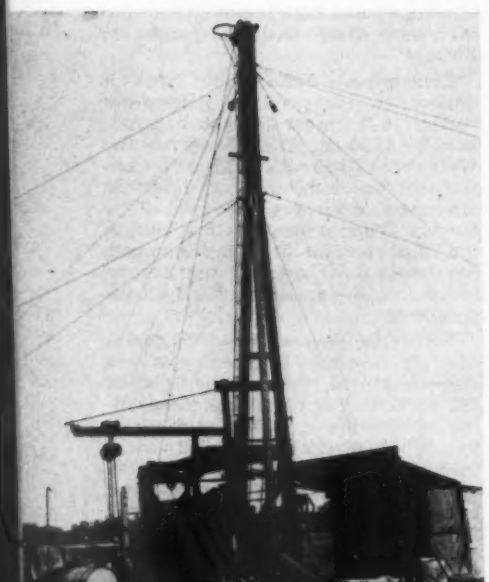
In drilling Lakota wells in the Sus-

*(Continued on page 59)*

*D. B. (Ben) Taliaferro, U. S. Bureau of Mines petroleum engineer, holds microphone feeding the bureau's public-address field car, as Kenneth Keas explains his water-flood operations to some 300 visiting members of the Kansas-Oklahoma Water-Flood Operators group. (For news story of the water-flood inspection trip, see Journal issue of June 1, 1950, page 36.)*

# Keas Drilling Co. Water Floods Bartlesville Sand in Neosho County, Kansas—700 Ft.

**by J. C. Joers,* P. Grandone,* and D. B. Taliaferro***



*Portable spudders used on Keas' water flood. Two of these are kept busy on the 1,200-acre property. A rig can complete one well a week.*

THE water-flooding project of Keas Drilling Co. in Sections 3, 4, 9, 10, and 15-27s-18e, Neosho County, includes the old Grant (W½ NW¼ Section 15, now combined with Speilman) and the Rosenthal leases, which were developed first for flooding in 1939 and 1940 by Kirby Oil Co., and the Speilman (in Section 3), Neyhard, Ames, and Nelson leases, which have been developed progressively since the end of 1946 by the present operator. The first two leases flooded were acquired by Grant-Mohan early in 1944, by Frank Young early in 1945, and by Keas Drilling Co. late in 1946. Fig. 1 is a map of the properties showing the development to March 2, 1950.

The formation being flooded in the Bartlesville sandstone, which is found in this area at an average depth of about 700 ft. and which has an average thickness of about 35 ft. Throughout most of the area the sand body, with a maximum thickness of 55 ft., is divided into two sections by a tight and relatively unproductive zone of sandy limestone. The lower section, with an average thickness of about 25 ft., is considered the more productive, although both sections are being flooded. The oil produced has a gravity of 32° A.P.I.

A summary of the analysis of a core from the Bartlesville sandstone taken from an input well on the Rosenthal lease is as follows:

| | Upper section | Lower section |
|---|---|---|
| Depth, ft. | 695.3-703.6 | 748.0-776.4 |
| Avg. permeability, md. | 28 | 52 |
| Avg. porosity, % | 17.4 | 19.4 |
| Avg. oil saturation, % | 24.8 | 41.0 |
| Avg. water saturation, % | 66 | 43 |
| Avg. oil content, bbl. per ac.-ft. | 335 | 618 |
| Total oil content, bbl. per acre | 2,640 | 16,610 |

### Early History of Leases

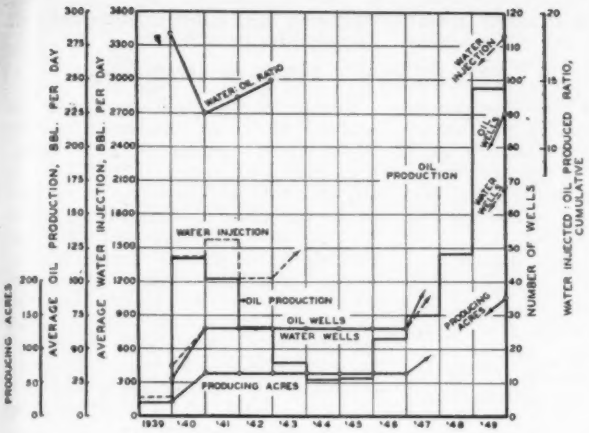
First drilling on the leases now being flooded started in 1903, and some have been redrilled as many as three times before water flooding. Oil was produced by pumping from the very beginning, but little is known about the amount of oil recovered by primary production methods.

Air injection was the only stimulative method of production attempted, and this was applied on a very limited scale, using only two injection wells on the Neyhard lease in 1920. However, the project was soon discontinued, because results did not appear too favorable. The oil recovery before water flooding is not known.

### Source and Treatment of Water

Water for flooding the Grant and Rosenthal leases by the former oper-

*Petroleum Experiment Station, U. S. Bureau of Mines, Bartlesville. Report prepared as part of annual inspection tour of properties, Kansas-Oklahoma Water - Flood Operators Group.


AVERAGE OIL PRODUCTION, BBL. PER DAY
AVERAGE WATER INJECTION, BBL. PER DAY
NUMBER OF WELLS
WATER INJECTED : OIL PRODUCED RATIO, CUMULATIVE
PRODUCING ACRES
WATER OIL RATIO
WATER INJECTION
OIL PRODUCTION
OIL WELLS
WATER WELLS
PRODUCING ACRES
1939 '40 '41 '42 '43 '44 '45 '46 '47 '48 '49

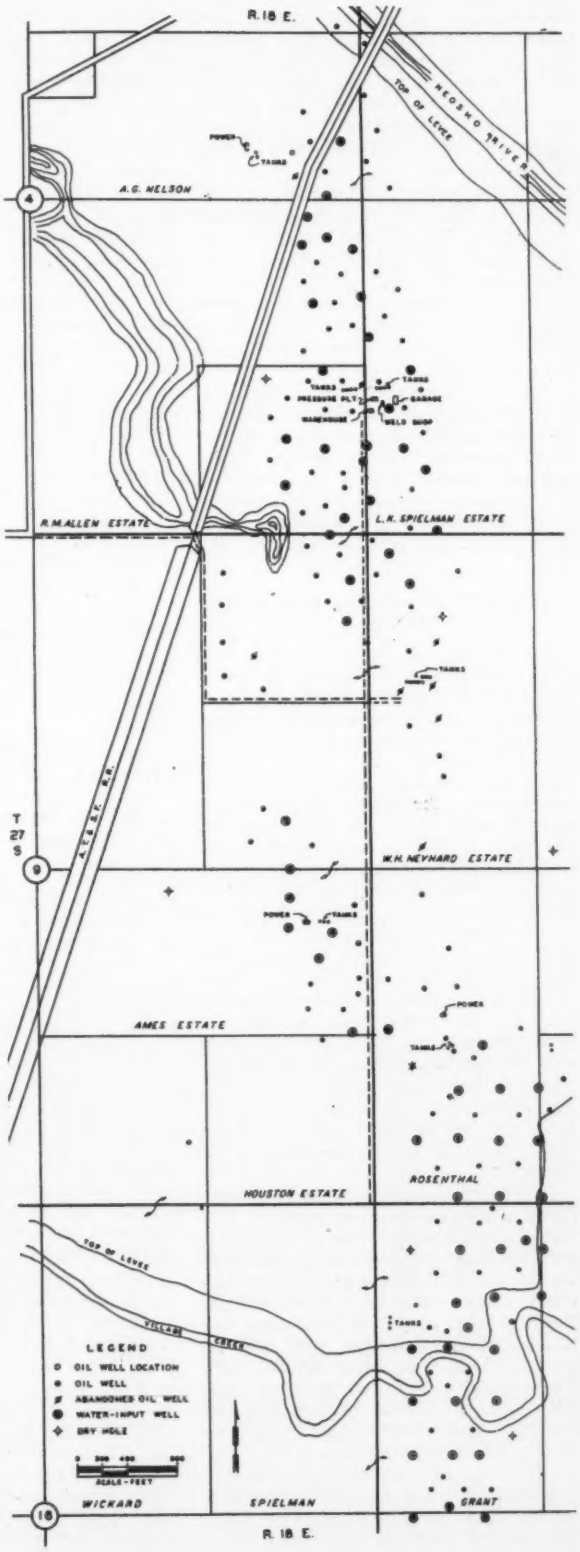
ators was from the Neosho River, but since that time the principal source of water for the entire project has been six shallow fresh-water wells, completed in a gravel bed at a depth of about 40 ft. The water from the gravel bed is preferred to the river water because of the unvarying quantity and composition of salts in solution in the gravel bed water and because of its clearness. It does contain a fairly high content of dissolved iron, but the uniformity of the water permits the use of a regular treating procedure.

The water from the gravel wells is pumped directly into the first of a series of five interconnected ponds. The open ponds provide enough aeration to oxidize the dissolved iron to the ferric state for precipitation before reaching the plant.

All return water and occasionally river water needed to maintain the supply are pumped into the ponds for mixing with the shallow-well water. From the fifth pond the raw water is pumped into a 500-bbl. treating and settling tank, where the necessary chemicals are added by an overhead mechanical feeder as it enters the top of the tank. The treated water then is pumped through a 6-ft. pressure-type filter filled

*Keas Drilling Co. produces its water-flood oil via small individually powered electric pump jacks; automatic time controller in box on power pole at right. The wells use 1-in. tubing for sucker rods, and the oil comes to the surface through that string, passing to the lead line through flexible rubber tubing (see photo). No casing is run in these shallow wells; 2-in. tubing is used in lieu (the casing nipple in photo is merely the end of a short conductor string). An insert-type pump barrel is run on the 1-in. tubing "sucker rods."*

*Left: Production data for the Keas Drilling Co. water-flood project. Below: The Bartlesville sand (average depth about 700 ft.) in this territory stretches out long and narrow. On map note the 2¼-mile north-south length of the Keas operation.*



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with sand and gravel and finally into a 500-bbl. clear-water supply tank.

Treatment and pH of the water are controlled by a commercial laboratory. For a water throughput of about 3,400 bbl. daily (during April 1950), 2 lb. of copper sulfate was used daily as an algaecide. In general, the raw water requires a minimum of treatment and filtering because it is relatively clear and chemically stable after oxidation and precipitation of dissolved iron in the ponds.

The present retention time for water in the treating tank is only about 3½ hours. No unusual corrosive effects from the treated water have been observed, even though cement-lined pipe is not used. It has been necessary to acidize several input wells to remove carbonate scale from the sand face.

An injection pressure of 800 psi. is maintained at the plant by means of three duplex, double-acting pumps each powered with a 50-hp. diesel engine. Electric power is generated for all other power requirements by three diesel-driven generators, each of which is rated at 30 kw. and 440 volt.

### Water-Flood Development and Operation

In developing the Rosenthal and Grant (now part of Speilman) leases for water flooding, the first operator drilled the wells on a fairly regular rectangular five-spot pattern with spacings between like wells of 330 ft. in the east-west and 420 ft. in the north-south direction. Development started in the fall of 1939, and by the end of 1940 a total of 63 acres with 26 water-input wells and 26 oil-producing wells were completed on the two leases.

No further development was carried out on adjoining leases until the property was acquired by Keas Drilling Co. This company leased a total of 1,200 acres late in 1946. Its property includes the developed flood and acreage adjacent to it. By March 1950 the company had extended the development to cover a total of 176 acres on which there are 90 active oil wells and 68 active input wells (see map).

Development is still in progress. No definite pattern or spacing has been followed on the leases developed for flooding by the Keas Drilling Co. In general, spacing between like wells ranges between 300 and 400 ft. The operator does not determine the use to which each new well will be put until it has been drilled and the cuttings have been examined. No cores are taken. Most of the old stripper wells are utilized as producers without workover.

All wells are completed alike for eventual flowing of the production on the new development. The wells are drilled through the entire sand section (two sections in many wells), and 2-in. tubing is set on a packer 5 ft. above the top of the sand and cemented with 24 sacks of cement. The packer used is the inexpensive rag type, which sets by pulling up on the tubing. No casing is used. Only the producing wells are shot, 3 qt. of nitroglycerin being used per foot of sand, except for the top 5 ft., which are not shot.

On the leases developed by Kirby Oil Co., the producing wells were equipped with 6¼-in. casing to the top of the sand and with 2-in. tubing through which the wells were pumped. Input wells on the leases developed before 1946 were equipped with 2-in. tubing cemented at the top of the sand. On the Rosenthal lease, however, three wells were dually completed in the two sand zones. A 1-in. string of tubing was set on a packer at the top (750 ft.) of the lower sand section and cemented back to the bottom of the upper sand section. A 2-in. string of tubing concentric with the first string then was run and set on a packer and cemented at the top of the upper sand section. Water is injected at the same pressure into each sand section but is metered separately.

All wells on the Grant and Rosenthal leases were shot with nitroglycerin. One quart per foot of sand was used in the producing wells and 2 qt. per foot of sand in the input wells.

All oil-producing wells completed since Keas Drilling Co. acquired the flood are equipped with small, individually powered electric pump jacks. An insert-type pump barrel is run on a 1-in. string of tubing. The tubing is attached to the pump jack, replacing the usual sucker rods and serving as the flow string. The pumps are kept running continuously at a rate high enough to keep the wells "pumped down" so long as the pump capacity permits. When a well starts to flow, the 1-in. tubing and pumping units are moved to a new well.

Wells on the old Grant lease were converted to flowing by Keas Drilling Co., but most of the wells on the Rosenthal lease are still pumped. The central power originally installed and still used on this property does not permit the flexibility of operation obtained on other leases by the use of individual pumping units.

Meters installed on all injection wells are used to facilitate the adjustment and control of injection rates and recently to provide monthly records. Water is started into each well at a daily rate of about 3 bbl. of water per foot of sand section until there is an increase in production of the offset wells. Then the rate is adjusted to keep the offset wells producing by continuous pumping. Only two wells have failed to produce continuously, and these are equipped with electric time controls for periodic pumping.

### Results of Flooding

Results of flooding show that the original 63 acres developed on the Grant (now Speilman) and Rosenthal leases produced 162,690 bbl. of oil, or 2,586 bbl. per acre, from 1939 to the end of 1946, when the property was acquired by Keas. At the end of 1949 there were 176 acres under flood (Fig. 1), from which the cumulative oil production by flooding was approximately 323,240 bbl.—or an average recovery of 1,837 bbl. of oil per acre. This recovery is in no way indicative of the ultimate recovery to be obtained, because large parts of the area either still are at peak rates of production or have not yet been affected by water injection. No flood production has been obtained yet from the Nelson lease (see Fig. 1).

It is impossible even to estimate the ultimate recovery from the leases developed in 1939 and 1940 from available data because of changes in operating methods and the fact that the production from one of these two leases has not been recorded separately since 1946 from that of other acreage developed more recently. The Rosenthal lease, on which separate production records have been kept, produced 76 per cent as much oil in 1949 as it did in 1941—the year of its peak flood production.

Fig. 2 shows graphically the production data on the flood that are available. The high rate of increase in the average daily oil production indicated during 1948 and 1949 will be continued during 1950 because of the rapid expansion of the project. The production during February 1950 averaged 348 bbl. of oil daily.

Little information is available on the quantity and rate of water injected during the entire operation of the project. Chart shows that the water-injection rate was about 1,200 bbl. daily at the end of 1942 on the 63 acres developed to that date, but this rate was increased to about 3,400 bbl. daily on 176 acres by April 1950. The current ratio of injected water to oil produced on the entire project has no significance at this time, because large quantities of water are being injected on part of the acreage that has not had time to respond to the flood.

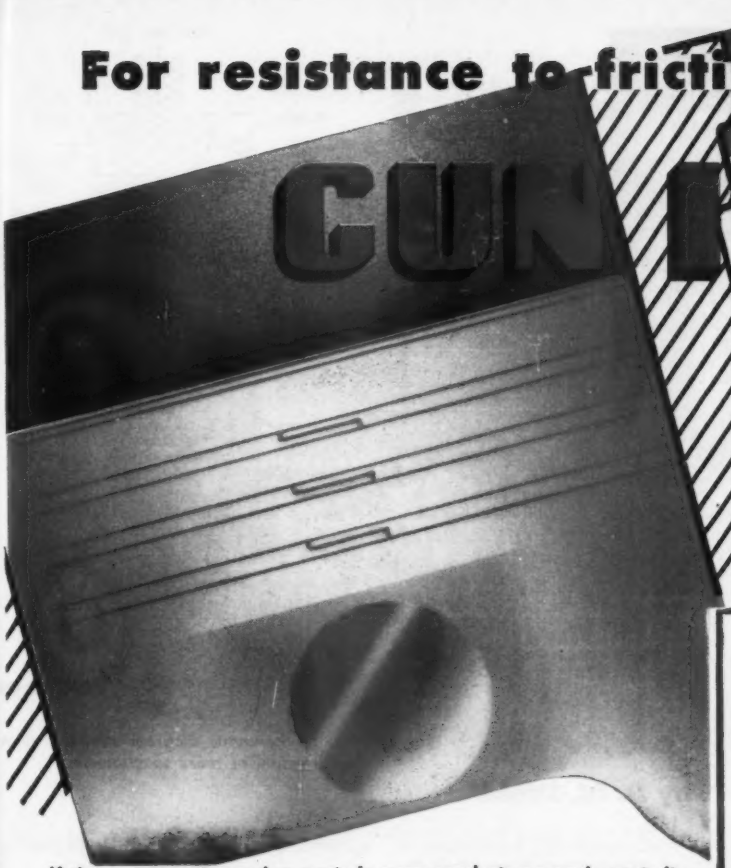
## BOOKS

**A.S.T.M. STANDARDS ON COPPER AND COPPER ALLOYS.** Published by American Society for Testing Materials, 1916 Race Street, Philadelphia. 500 pp. Paper cover, $4.35; cloth cover, $5.

This latest edition brings together in convenient form the 105 A.S.T.M. standards pertaining to copper and copper-base alloy products which were developed by Committee B-5 and other A.S.T.M. technical committees. Also included are nine test methods covering expansion, mercurous nitrate, resistivity, tension, hardness, sampling, and grain-size evaluations.

# For resistance to frictional wear...

# GUN IRON CASTINGS



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XUM

# MASS SPECTROMETER

**by R. M. Ifield***

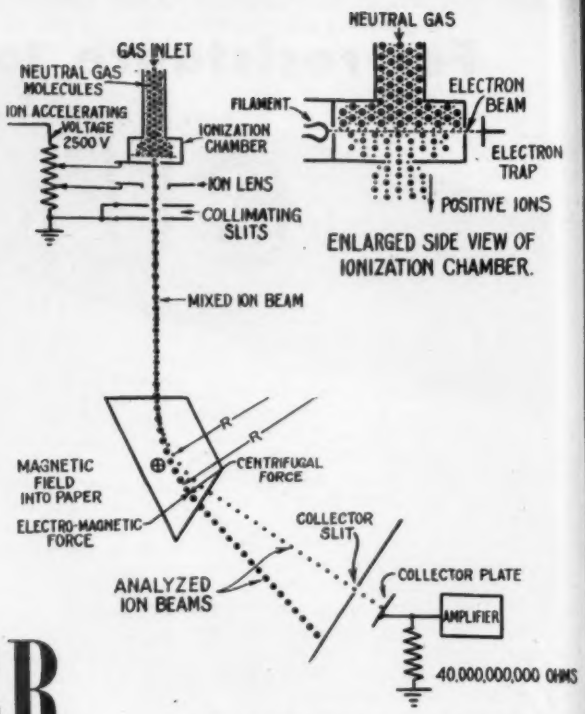



*Fig. 1—Schematic diagram showing operating principle of mass spectrometer.*

PROGRESS in a semiautomatic and automatic methods of analyzing gases, liquids, and solids has increased in rapid strides during the past few years. Much has been accomplished by way of applied physics and instrument design to speed up and simplify former arduous and time-consuming test-tube procedures which were reliable only in the hands of an experienced chemist. Today a qualified technician, using modern tools, can run more analyses in a given time and, in the majority of instances, with much greater precision than the highly qualified scientists could effect with what was conventional analytical equipment just a few years ago.

The new General Electric recording mass spectrometer is an excellent example of one of these modern analytical tools. The versatility of the instrument permits highly varied applications in numerous industries. It is finding increasingly wide use in the petroleum, chemical, and associated process industries.

*Special Products Division, General Electric Co., Schenectady, N. Y.

### Both Qualitative and Quantitative Analysis

The mass spectrometer can be used effectively for both qualitative and quantitative measurements. Accumulated data from the qualitative analysis of various molecular fragmentation patterns make it possible reliably to estimate the primary constituents of an unknown mixture. Usually a file of known compositions, classified as to prominent peaks and relative peak heights, is maintained to facilitate the qualitative determination of unknown substances. The ap-

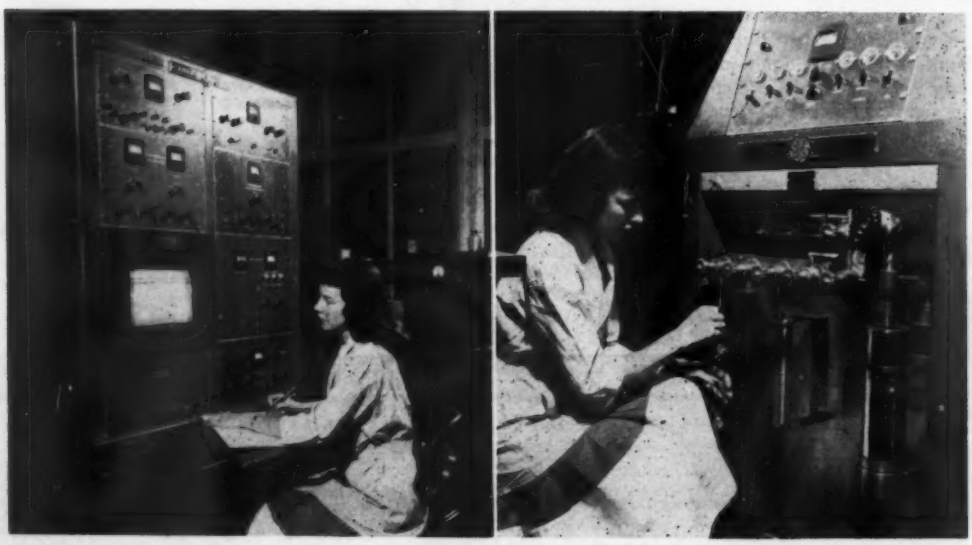
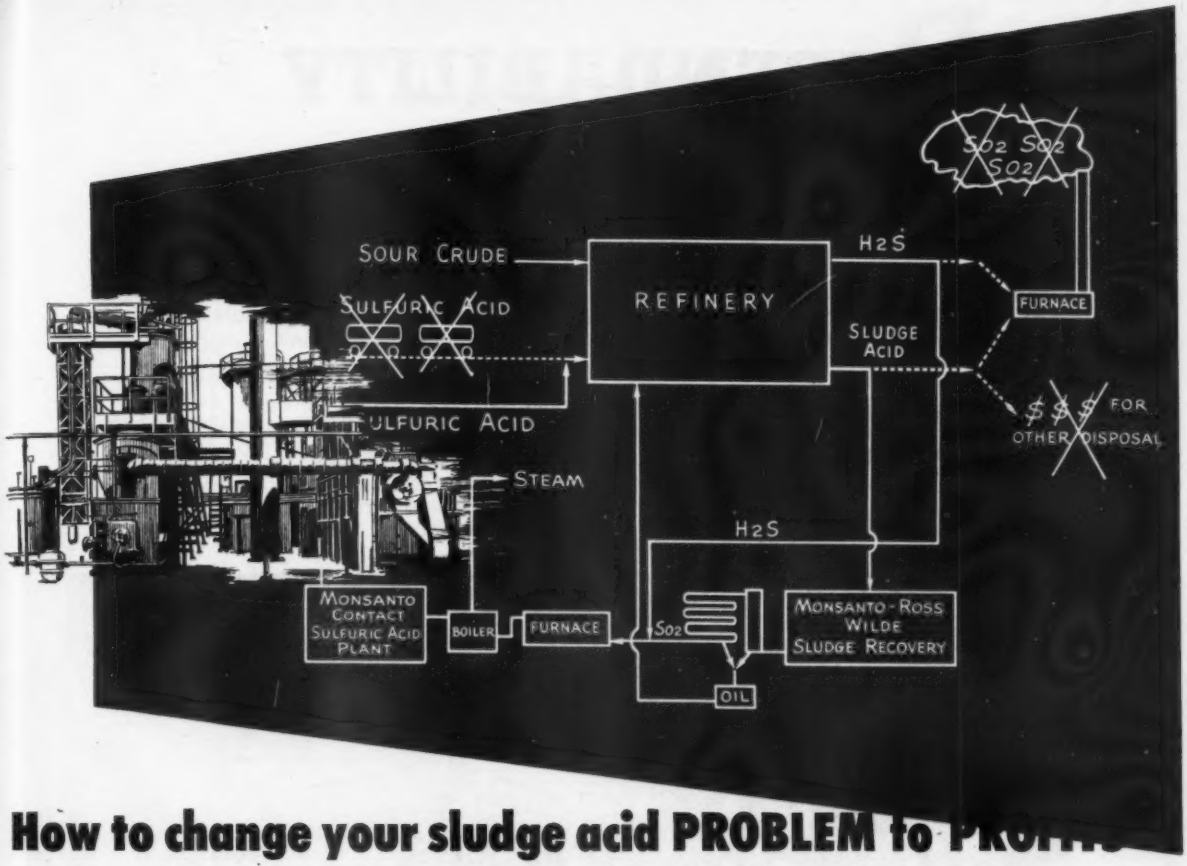


*Fig. 2—(Left) During mass-spectrometric analysis of unknown gas sample, operator takes notes to aid in interpretation of automatically recorded Electronik mass spectrum. Fig. 3 (Right)—Mass-spectrometer operator introducing gas sample into sample system of analytical mass spectrometer. After sample system has been evacuated, low-pressure sample gas is introduced into a measured volume of the system, and provides for the mass spectrometric analyses of the unknown gas.*




# How to change your sludge acid PROBLEM to PROFIT

If disposal of sludge acid and $H_2S$ is an expensive problem at your refineries, you stand to profit by looking into Monsanto's thoroughly proved process for recovering usable products from these wastes.

Installation of a Monsanto Contact Sulfuric Acid Plant and a Monsanto-Ross Wilde Sludge Recovery Unit *saves* the dollars you now are spending to dispose of sludge acid and $H_2S$. That's an important economy for many refineries. In addition, you gain better community relations by eliminating pollution of the air and streams.

The Monsanto method not only *saves* dollars, but *earns* dollars. It recovers oil that can be refined into salable products. It produces clean, high-grade sulfuric acid for use in refinery processes. It generates steam that can be used in your operations.

Call in a Monsanto representative and let him tell you how economically you can change your problem into profit. His call will not obligate you or your company. For prompt response, mail the coupon or write: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1745-E South Second Street, St. Louis 4, Mo.

**FREE BOOKLET** *gives details on sludge acid recovery. Mail the coupon for your copy.*

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Without cost or obligation to my company, please send: .....representative to discuss ways of changing sludge acid and $H_2S$ into dollars. Also, if checked, send .....booklet on sludge acid recovery.

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*Street*.....

*City*.....*Zone*....*State*.....

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## RESEARCH AND ENGINEERING

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This and other steps, from special steel specifications through final inspection, comprise the exclusive SMITHway process of line-pipe manufacture which assures a stronger, more uniform product.

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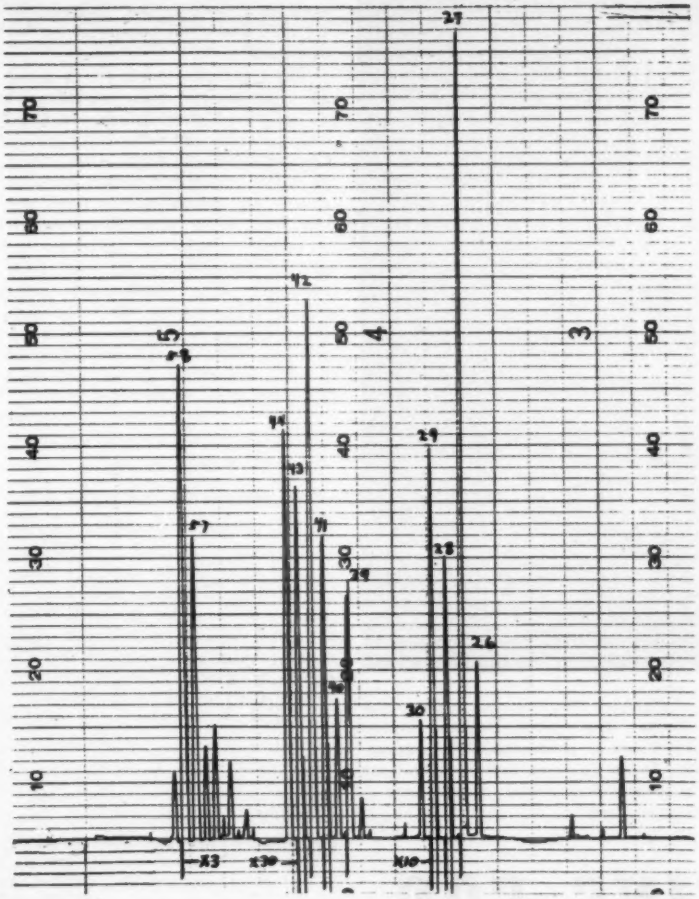


*Fig. 4—Mass spectral data.—Sample: n-butane ($C_4H_{10}$)*

| Mass | Relative abundance |
|---|---|
| 27 | 20.4 |
| 28 | 26.6 |
| 29 | 36.3 |
| 39 | 6.81 |
| 41 | 28.8 |
| 42 | 14.1 |
| 43 | 100.0 |
| 57 | 2.47 |
| 58 | 12.6 |

paratus is calibrated periodically with pure samples of all vital constituents for the purposes of qualitative analysis.

Normal sensitivity of the instrument is 1 part in 10,000; adjustments can be made under special conditions for a sensitivity of 1 part in 100,000. Chart sensitivity is automatically changed over a range of 30 to 1, with a manual extension over a range of 100 to 1.

As denoted by its name, the mass spectrometer analyzes a gaseous mixture first by ionizing the gas and then by sorting these ions according to their mass. The operating principle is illustrated schematically in Fig. 1.

In operation, the sample to be analyzed is admitted as neutral gas molecules are fed into the ionization chamber at low pressure from an expansion volume through a leak so as to obtain a constant flow without discrimination into the spectrometer tube, where a high vacuum is maintained by continuous pumping.

In the ionization chamber, some of the gas molecules of each constituent are converted to positively charged ions as a result of colliding with electrons emitted by the heated filament. Other neutral molecules which are not affected by the electric field in the chamber are withdrawn by an exhaust pump. The ionized molecules, however, are accelerated by high voltage and focused into a beam which passes through the narrow collimating slit into a region within the spectrometer tube where no electric field exists.

In the spectrometer tube the ion beam is deflected by the varying magnetic field which causes ions of specific mass to follow orbital paths of a certain radii, as shown. With the magnetic field at a certain known intensity, ions with a particular specific mass will follow a definite path through the magnetic field. They then pass through a narrow collector slit so as to reach the collector plate and produce a measurable electric current.

As the magnetic field intensity is varied by changes in the current through the magnet, the mass spectrum is scanned. By correlation of changes in magnet current with movement of the Brown recorder chart, the time divisions of the recorder chart become indicative of the mass numbers being measured. To adjust automatically the sensitivity and speed of the recorder for optimum recording of each mass peak, a precollector circuit is employed.

The precollector circuit includes a precollector which comprises a fine wire electrode. This electrode collects ions of the mass number under measurement prior to their passing through the collector slit to the collector plate. The current from this electrode, therefore, constitutes a preliminary measurement of the abundance of the mass which is about to be measured. Thus, by means of suitable circuits, the recorder is made cognizant of the mass and its abundance before measurement so that the recorder can be automatically adjusted accordingly.

**Operating characteristics.**—The G.E. mass spectrometer provides an extremely wide scanning range. A mass range of 1 to 300 is readily obtained with automatic magnetic scanning. Higher masses to 400 can be measured by adjusting the accelerating voltage. The mass of an ion is the sum of its nuclear particles—for instance, $CO_2$ has a mass of 44 (C = 12, O = 16).

With the recording type of spectrometer, analytical results become apparent coincident with the scanning of the mass spectrum and the presence of any isotopes is revealed before the analysis is complete. The operator also can make notes directly on the chart to facilitate later analysis. The average time required to record the mass spectrum from mass 1 to mass 100 is approximately 10 minutes.

The time required to scan depends upon the number of peaks. This is because the recorder is automatically slowed down as each peak is being recorded. Full scale peaks require about four seconds to be recorded.

### Industrial Uses—Petroleum Industry

Analysis by mass separation aids in setting up distillation columns for optimum operation, thereby affecting a reduction in costs and an improved efficiency. Analysis of process streams in thermal cracking units permits evaluation of potential outputs and processing efficiency.

In catalytic cracking, the study of operating unit conditions feasible with the spectrometer aids in revising and adjusting the cracker to obtain top production with the desired ratio of paraffins, olefins, and other hydrocarbon products. The apparatus also facilitates the analysis of light hydrocarbon streams such as overheads and bottoms of depropanizers and debutanizers. For example, a typical overhead analysis resolves n-butane ($C_2H_5)_2$, isobutane $(CH_3)_3CH$, propane ($C_3H_8$), ethane ($C_2H_6$), and methane ($CH_4$).



XUM

*OLEFINS FROM REFINERY GASES.—Large volumes of ethylene are converted to petroleum chemicals by Jefferson Chemical Co. at the Port Neches, Tex., plant. Ethylene glycol, diethylene glycol, ethylene oxide, and ethylene dichloride are in production. The company is jointly owned by American Cyanamid Co. and The Texas Co., and raw hydrocarbons are provided from the latter's 190,000-bbl. refinery at nearby Port Arthur. Shown here is Jefferson's ethylene purification unit.*

# Use of OLEFINS FOR CHEMICAL PRODUCTION —1940—1950

**by Robert S. Aries* and William Copulsky***

A TREMENDOUS growth has taken place in the use of the olefins for chemical production, in the 11-year period from 1940 to 1950 inclusive. The most important of these olefins have been ethylene, butylene, propylene, and isobutylene, all derived from petroleum. The chemicals and products prepared from them include ethyl alcohol, permanent antifreeze, ethyl fluid, vinyl and styrene plastics, synthetic rubber, isopropyl and butyl alcohols, and many others. By a detailed end-use analysis of these olefins, an attempt has been made to reconstruct the statistics of consumption and value for the period.

Total production of the four olefins from 1940 to 1950 is estimated to be 20,131,000,000 lb., having a total value (in current dollars) of $851,000,000. Production increased more than fivefold from 606,000,000 lb. in 1940 to 3,343,000,000 lb. in 1950, while dollar value increased about 600 per cent from $26,000,000 in 1940 to $154,000,000 in 1950.

Table 1 summarizes the consumption of the four olefins by the chemical industry from 1940 to 1950 by weight, and Table 2 summarizes the value of the olefins.

It should be noted that although government statistics are available to some extent on these products, a superficial examination will show that the government figures are incomplete and may represent as little as 30 per cent of the actual figure. This in most cases is the result of necessary restrictions protecting company sales figures and data reported to the Government.

For example, prior to 1949 the Tariff Commission only partially reported ethylene production. The reported 1948 production was only 383,000,000 lb. of ethylene from petroleum; the amount produced from alcohol and coke-oven gas was not reported. The statistics have now been made more complete than in previous reports, and in the preliminary report for 1949 released May 1950, production of ethylene is reported to be 1,129,482,000 lb. of which 144,700 lb. is derived from alcohol. The small amount produced from coke oven gas is not reported. The amount reported by the Tariff Commission corresponds closely to that calculated from a detailed end-use analysis.

### Half Billion from Olefins Annually

The primary products made from olefins have a total yearly value of almost $500,000,000 at the present time (Table 7) and $2,900,000,000 for the 11-year period. The present volume is almost 5 billion pounds per year. Primary products are considered the first products made from the olefin appearing in commercial channels.

Based on statistics of the Tariff Commission it is estimated that the total value and volume of synthetic organic chemicals in 1950 will be as follows:

**SYNTHETIC ORGANIC CHEMICALS, 1950**

| | Prod., million pounds | Value, million dollars |
|---|---|---|
| Raw materials from coal | 20,000 | $400 |
| Raw materials from petroleum | 8,000 | 200 |
| Synthetic organic chemicals | 22,000 | 4,400 |
| Grand total | 50,000 | $5,000 |

Of course there is considerable duplication in these figures, since many of the materials reported enter into the production of other products also included, but for a qualitative rather than a quantitative estimate, here is the estimated production of olefins and the primary products derived from them in 1950:

**OLEFINS AND PRIMARY PRODUCTS, 1950**

| | Prod., million pounds | Value, million dollars |
|---|---|---|
| Olefins from petroleum | 3,343 | $154 |
| Derived primary products | 4,735 | 477 |
| Total | 8,078 | $631 |

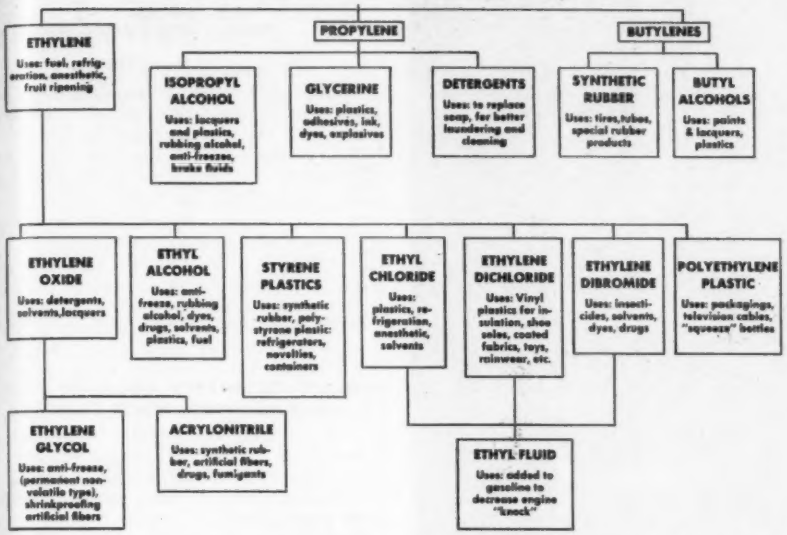
This comparison shows that in all probability the olefins as raw materials account for over 10 per cent of the total production and value of synthetic organic chemicals.

### Fourfold Growth in Ethylene

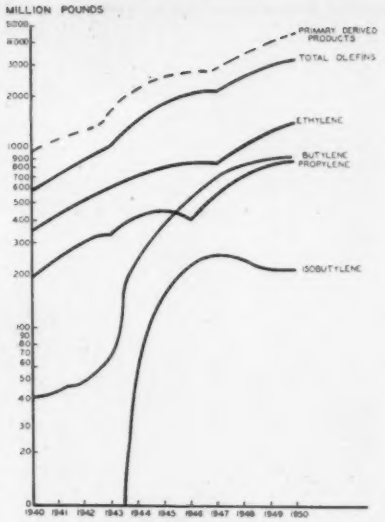
The growth of the ethylene industry is especially striking, from 370,000,000 lb. in 1940 to almost 1.5 billion pounds at present, a fourfold

*R. S. Aries and Associates, 400 Madison Avenue, New York.

## Some Commercial Uses of Olefins


ETHYLENE
Uses: fuel, refrigeration, anesthetic, fruit ripening
PROPYLENE
BUTYLENES
ISOPROPYL ALCOHOL
Uses: lacquers and plastics, rubbing alcohol, anti-freezes, brake fluids
GLYCERINE
Uses: plastics, adhesives, ink, dyes, explosives
DETERGENTS
Uses: to replace soap, for better laundering and cleaning
SYNTHETIC RUBBER
Uses: tires, tubes, special rubber products
BUTYL ALCOHOLS
Uses: paints & lacquers, plastics
ETHYLENE OXIDE
Uses: detergents, solvents, lacquers
ETHYL ALCOHOL
Uses: anti-freeze, rubbing alcohol, dyes, drugs, solvents, plastics, fuel
STYRENE PLASTICS
Uses: synthetic rubber, polystyrene plastic: refrigerators, novelties, containers
ETHYL CHLORIDE
Uses: plastics, refrigeration, anesthetic, solvents
ETHYLENE DICHLORIDE
Uses: Vinyl plastics for insulation, shoe soles, coated fabrics, toys, rainwear, etc.
ETHYLENE DIBROMIDE
Uses: insecticides, solvents, dyes, drugs
POLYETHYLENE PLASTIC
Uses: packagings, television cables, "squeeze" bottles
ETHYLENE GLYCOL
Uses: anti-freeze, (permanent non-volatile type), shrinkproofing artificial fibers
ACRYLONITRILE
Uses: synthetic rubber, artificial fibers, drugs, fumigants
ETHYL FLUID
Uses: added to gasoline to decrease engine "knock"

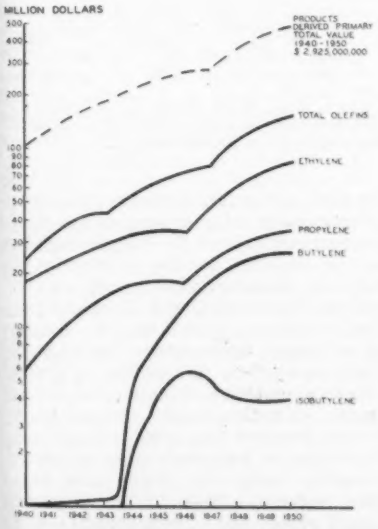
*From 1949 Annual Report, Chemical Research Corp., Detroit*




***Production of major petrochemicals, 1940-1950 (millions of pounds).***

increase (Table 1). Ethylene oxide production and ethyl alcohol production have grown rapidly, but the big newcomer is polyethylene. Production of ethyl benzene, from which styrene is made, has been slowing down due to shortages of benzene, and maturity of the styrene-rubber industry. Ethyl chloride, ethylene dichloride, and ethylene dibromide are the principal components of ethyl fluid to decrease engine knock in automobiles. Ethylene dichloride is also important as a raw material for the production of vinyl plastics. Ethyl-fluid production has been leveling off, and the rate of growth of vinyl plastics is not as great as it once was. (Table 2).

Ethylene oxide will be of growing importance, as new uses are found




***Value of major petrochemicals, 1940-1950 (millions of dollars).***

**TABLE 1—CONSUMPTION OF OLEFINS BY THE CHEMICAL INDUSTRY, 1940-1950**

**Millions of Pounds**

| Year | Ethylene* | Propylene† | Butylene‡ | Isobutylene¶ | Total | Index of total 1940 = 100 |
|---|---|---|---|---|---|---|
| 1950 | 1,440 | 882 | 904 | 117 | 3,343 | 550 |
| 1949 | 1,280 | 882 | 900 | 117 | 3,179 | 525 |
| 1948 | 1,060 | 734 | 922 | 137 | 2,853 | 474 |
| 1947 | 855 | 598 | 564 | 162 | 2,179 | 360 |
| 1946 | 820 | 430 | 699 | 217 | 2,166 | 357 |
| 1945 | 770 | 459 | 368 | 143 | 1,740 | 287 |
| 1944 | 740 | 437 | 264 | 57 | 1,498 | 245 |
| 1943 | 585 | 330 | 60 | 5 | 980 | 162 |
| 1942 | 520 | 310 | 52 | ..... | 822 | 136 |
| 1941 | 430 | 230 | 45 | ..... | 705 | 116 |
| 1940 | 370 | 194 | 42 | ..... | 606 | 100 |
| Total | 8,870 | 5,486 | 4,820 | 955 | 20,131 | ..... |

**Millions of Dollars**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1950 | 87 | 36 | 27 | 4 | 154 | 590 |
| 1949 | 77 | 36 | 27 | 4 | 144 | 551 |
| 1948 | 65 | 30 | 27 | 4 | 126 | 485 |
| 1947 | 42 | 24 | 13 | 5 | 84 | 324 |
| 1946 | 35 | 18 | 14 | 6 | 73 | 280 |
| 1945 | 34 | 19 | 7 | 4 | 64 | 246 |
| 1944 | 36 | 18 | 5 | 2 | 61 | 235 |
| 1943 | 29 | 14 | 1 | ..... | 44 | 170 |
| 1942 | 29 | 13 | 1 | ..... | 43 | 166 |
| 1941 | 22 | 9 | 1 | ..... | 32 | 123 |
| 1940 | 19 | 6 | 1 | ..... | 26 | 100 |
| Total | 475 | 223 | 124 | 29 | 851 | ..... |

*See Table 2. †See Table 4. ‡See Table 5. ¶See Table 6.

**TABLE 2—CONSUMPTION OF ETHYLENE BY USE BY THE CHEMICAL INDUSTRY 1940-1950**

(Millions of pounds)

| Year | Ethylene oxide* | Ethyl alcohol | Ethyl benzene | Ethyl chloride | Ethylene dichloride | Ethylene dibromide | Polyethylene | Others | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1950 | 480 | 480 | 114 | 93 | 90 | 30 | 80 | 73 | 1,440 |
| 1949 | 400 | 450 | 110 | 87 | 87 | 29 | 53 | 64 | 1,280 |
| 1948 | 335 | 360 | 108 | 82 | 76 | 26 | 18 | 55 | 1,060 |
| 1947 | 235 | 320 | 88 | 71 | 64 | 20 | 14 | 43 | 855 |
| 1946 | 200 | 310 | 116 | 66 | 59 | 19 | 12 | 38 | 820 |
| 1945 | 205 | 270 | 116 | 66 | 55 | 18 | 6 | 34 | 770 |
| 1944 | 198 | 265 | 113 | 63 | 50 | 17 | 3 | 31 | 740 |
| 1943 | 182 | 240 | 28 | 54 | 37 | 14 | 1 | 29 | 585 |
| 1942 | 178 | 220 | 4 | 51 | 29 | 12 | 0 | 26 | 520 |
| 1941 | 143 | 180 | 2 | 50 | 24 | 10 | 0 | 21 | 430 |
| 1940 | 125 | 150 | 1 | 48 | 19 | 10 | 0 | 17 | 370 |
| Total | 2,681 | 3,245 | 800 | 731 | 590 | 205 | 187 | 431 | 8,870 |

*See Table 3.



XUM

*DIRECT OXIDATION OF PROPANE AND BUTANES.—Celanese Corp. produces by this process a growing line of chemicals at its Chemcel plant at Bishop, Tex., (near Corpus Christi). The towering series of fractionation columns shown here performs part of the difficult separation of oxygenated chemicals derived from the raw products in turn produced principally from natural-gas processing.*

**TABLE 3—CONSUMPTION OF ETHYLENE IN ETHYLENE OXIDE DERIVATIVES BY THE CHEMICAL INDUSTRY, 1940-50**
(Millions of pounds)

| Year | Ethylene glycol | Glycol ethers | Ethanol-amines | Acrylo-nitrile | Detergents | Others | Total |
|---|---|---|---|---|---|---|---|
| 1950 | 348 | 54 | 28 | 10 | 18 | 22 | 480 |
| 1949 | 280 | 52 | 27 | 8 | 14 | 19 | 400 |
| 1948 | 225 | 50 | 25 | 8 | 10 | 17 | 335 |
| 1947 | 137 | 46 | 22 | 8 | 6 | 16 | 235 |
| 1946 | 114 | 43 | 19 | 8 | 2 | 14 | 200 |
| 1945 | 125 | 42 | 17 | 8 | 1 | 12 | 205 |
| 1944 | 123 | 40 | 15 | 10 | 0 | 10 | 198 |
| 1943 | 114 | 38 | 13 | 9 | 0 | 8 | 182 |
| 1942 | 120 | 37 | 10 | 5 | 0 | 6 | 178 |
| 1941 | 94 | 36 | 8 | 1 | 0 | 4 | 143 |
| 1940 | 82 | 35 | 6 | 0 | 0 | 2 | 125 |
| Total | 1,762 | 473 | 190 | 75 | 51 | 130 | 2,681 |

**TABLE 4—CONSUMPTION OF PROPYLENE BY USE IN CHEMICAL INDUSTRY, 1940-1950**
(Millions of pounds)

| Year | Isopropyl alcohol | Cumene | Others* | Total |
|---|---|---|---|---|
| 1950 | 735 | .... | 147 | 882 |
| 1949 | 735 | .... | 147 | 882 |
| 1948 | 612 | .... | 122 | 734 |
| 1947 | 498 | .... | 100 | 598 |
| 1946 | 358 | .... | 72 | 430 |
| 1945 | 360 | 27 | 72 | 459 |
| 1944 | 353 | 13 | 71 | 437 |
| 1943 | 275 | .... | 55 | 330 |
| 1942 | 258 | .... | 52 | 310 |
| 1941 | 192 | .... | 38 | 230 |
| 1940 | 162 | .... | 32 | 194 |
| Total | 4,538 | 40 | 908 | 5,486 |

*Includes allyl chloride, glycerin, allyl alcohol, tetrapropylene polymer, propylene glycol, propylene oxide, isopropyl ether.

**TABLE 5—CONSUMPTION OF BUTYLENE BY USE IN CHEMICAL INDUSTRY, 1940-1950**
(Millions of pounds)

| | Synthetic rubber | Secondary butyl alcohol | Total |
|---|---|---|---|
| 1950 | 800 | 104 | 904 |
| 1949 | 800 | 100 | 900 |
| 1948 | 820 | 102 | 922 |
| 1947 | 490 | 74 | 564 |
| 1946 | 632 | 67 | 699 |
| 1945 | 306 | 62 | 368 |
| 1944 | 202 | 62 | 264 |
| 1943 | .... | 60 | 60 |
| 1942 | .... | 52 | 52 |
| 1941 | .... | 45 | 45 |
| 1940 | .... | 42 | 42 |
| Total | 4,050 | 770 | 4,820 |

**TABLE 6—CONSUMPTION OF ISOBUTYLENE BY USE IN CHEMICAL INDUSTRY, 1940-1950**
(Millions of pounds)

| | Isobutyl rubber | Tertiary butyl alcohol | Total |
|---|---|---|---|
| 1950 | 112 | 5 | 117 |
| 1949 | 112 | 5 | 117 |
| 1948 | 132 | 5 | 137 |
| 1947 | 158 | 4 | 162 |
| 1946 | 214 | 3 | 217 |
| 1945 | 141 | 2 | 143 |
| 1944 | 55 | 2 | 57 |
| 1943 | 3 | 2 | 5 |
| 1942 | .... | .... | .... |
| 1941 | .... | .... | .... |
| 1940 | .... | .... | .... |
| Total | 927 | 28 | 955 |

**TABLE 7—ESTIMATED VALUE OF PRIMARY PRODUCTS MADE FROM OLEFINS, 1950**

| Product— | Prod., million lb. | Value, cents per lb. | Value, million dollars |
|---|---|---|---|
| From ethylene: | | | |
| Ethylene oxide | 532 | 0.1675 | $89.0 |
| Alcohol, ethyl | 730 | 0.05 | 36.5 |
| Ethyl benzene | 420 | 0.13 | 55.0 |
| Ethyl chloride | 300 | 0.135 | 40.5 |
| Ethylene dichloride | 280 | 0.08 | 22.4 |
| Ethylene dibromide | 175 | 0.25 | 43.8 |
| Polyethylene | 80 | 0.40 | 32.0 |
| Others | 125 | 0.12 | 15.0 |
| Total from ethylene | 2,642 | | $334.2 |
| From propylene: | | | |
| Isopropyl alcohol | 1,000 | 0.049 | 49.0 |
| Others | 200 | 0.05 | 10.0 |
| Total from propylene | 1,200 | | $59.0 |
| From butylene: | | | |
| Butadiene | 650 | 0.08 | 52.0 |
| Secondary butyl alcohol | 137 | 0.09 | 12.4 |
| Total from butylene | 787 | | $64.4 |
| From isobutylene: | | | |
| Butyl rubber | 100 | 0.19 | 19.0 |
| Tertiary butyl alcohol | 6 | 0.12 | 0.7 |
| Total from isobutylene | 106 | | $19.7 |
| Total from all olefins | 4,735 | | 477.3 |

The volume of the chemicals produced in 1940 was approximately 990 million pounds and value about $100,000,000.

for derivatives. The big question mark in expansion of ethylene oxide production is acrylonitrile. Large volumes will be required for the production of the new synthetic fibers such as Orlon (du Pont) and Dynel (Carbide) but studies indicate that it may be cheaper to make acrylonitrile from acetylene—propylene is another alternative raw material. Ethylene glycol is another question mark. Consumption of this product has always been underestimated, and production and consumption have only come into balance recently. Meanwhile, ethylene glycol prices have risen steadily and a price cut will probably eat up large volumes of production.

## Photography Proves Valuable Tool

*(Continued from page 42)*

Other occasional uses for photomicrography include checking of particle sizes of abrasives and of catalysts used in the catalytic cracker, and metallographic studies of ruptured or broken parts to determine the cause of failure.

The photomicrographic setup, shown in Fig. 11, consists of a Bausch & Lomb Model L reflex camera. Illumination is by a 6-volt 18-amp. ribbon-filament bulb. The temperature-control equipment for wax photomicrography shown in the picture is of our own design.

Control is attained by placing the glass slide holding the sample in a water-jacketed, insulated container (shown on the microscope stage). Water at the desired temperature is circulated through the jacket from the double water bath shown at the right. The double-bath system is used to prevent any possibility of shock chilling the sample, with the resultant change of crystal forms, and lack of reproducibility of results.

This system permits any desired temperature or rate of temperature change to be maintained at the microscope stage. A separate vertical illuminating system for the microscope and a set of metallographic lenses are available for use when making photomicrographs of metals or other opaque specimens.

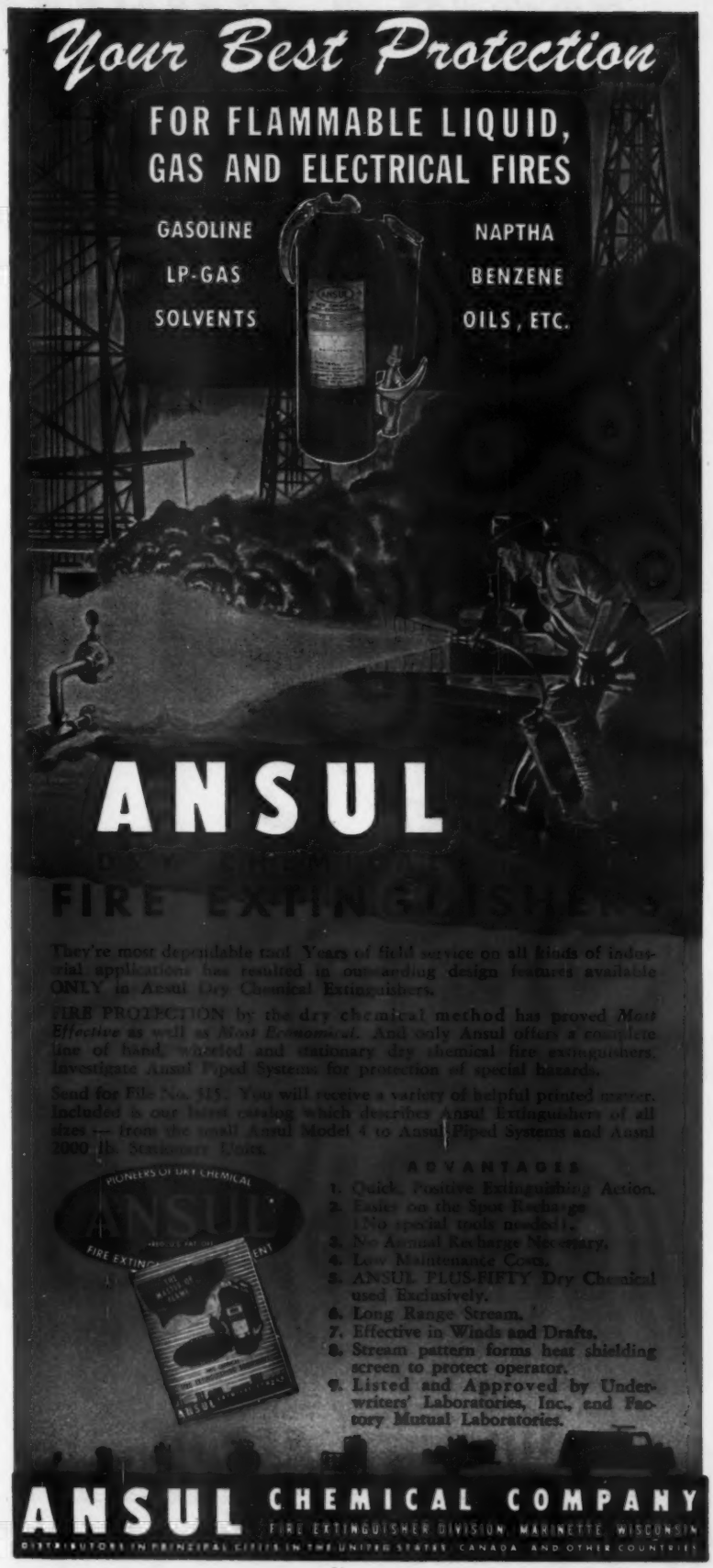
### Photographic Equipment Used by Sinclair

Aside from photomicrography, al pictures are taken with a 4 by 5-in. view camera, with which are used 6½-in. lens, convertible to 9 or 14-in. focal lengths for obtaining larger images on films, and a 4-in.-wide field lens, used principally in tight quarters, where there would not be room to get the entire subject on the film were a longer lens used. We plan to add soon a 4 by 5-in. press camera for use where it is inconvenient or impossible to set up a tripod to hold the view camera.

Printing equipment includes contact printers and an enlarger. All tanks and trays used for processing films and prints are of stainless steel. Electric driers are provided for drying prints.

Two special backgrounds which were built to our specifications are kept in the photographic laboratory. The first is merely a rack for holding objects up to the size of a 5-gal. can, and which may be covered with paper, etc., to provide light or dark backgrounds, as may be desired.

The other special background is a box 5 ft. square by 1 ft. deep, painted black on the outside and white on the inside. A 40-in. square plate glass is set into one side. Twelve light bulbs surround the glass inside the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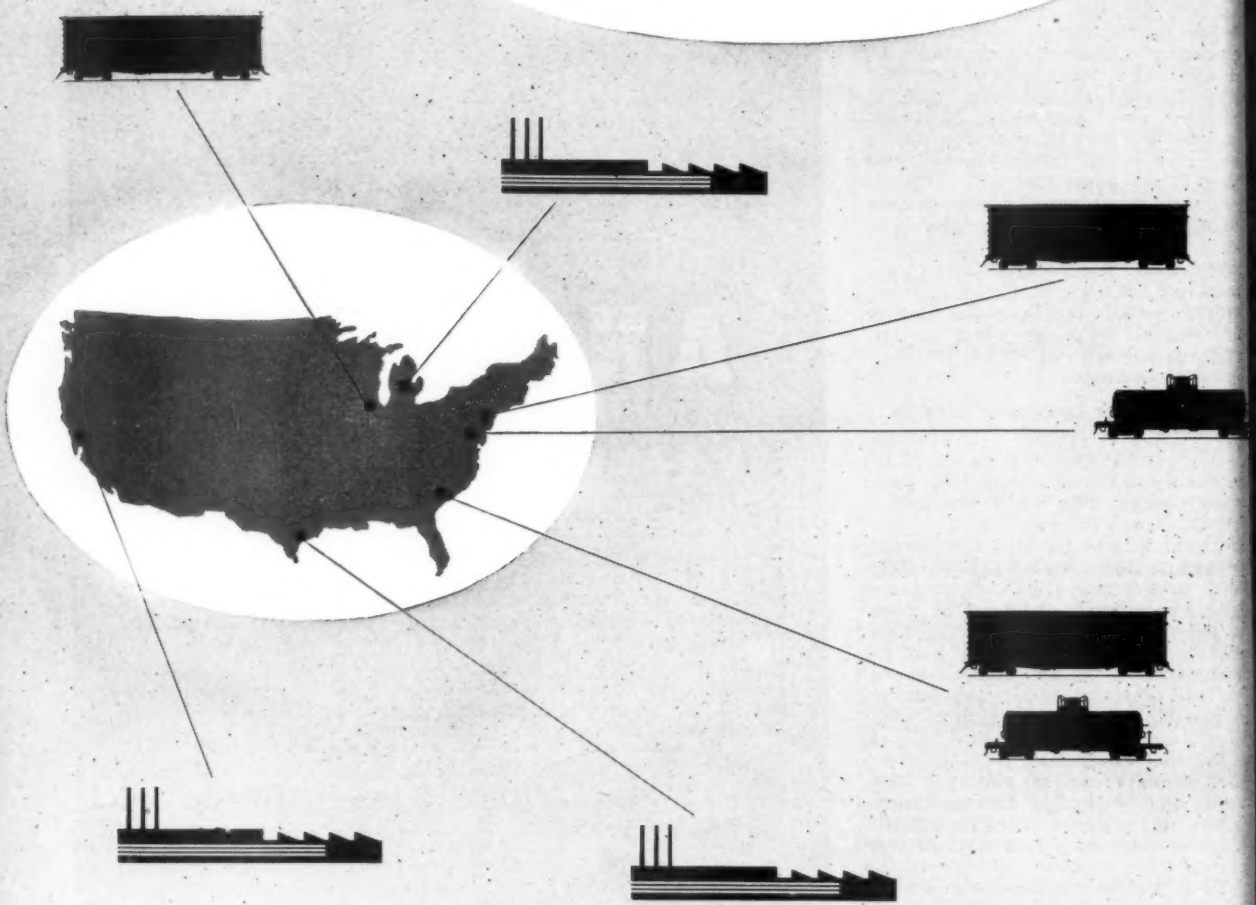

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box to provide an illuminated background. This eliminates cast shadows, and has been found very useful in the photography of many small items, where such shadows might be confusing.

A small amount of color photography is being done, principally for publicity and advertising use. Then, too, there are occasions when pictures are wanted of subjects which have too little contrast to photograph satisfactorily in black and white, but which give much better detail in color. Kodak Ektachrome film is used for all color work, transparencies only being made, since we do not have facilities for color printing.

Copying of drawings, manuscripts, etc., other than by blueprint techniques, is also a function of the photographic laboratory. "Photocopy" equipment and procedures are used when same size copies are desired. Otherwise, normal photographic processes are followed.

The use of photography at Sinclair's East Chicago refinery has grown steadily from the time the first pictures were taken with a camera borrowed from one of the employes, until now, there is hardly a department in the refinery which doesn't make some use of the photographic laboratory.

## Drilling Development In Sussex Area

*(Continued from page 45)*

sex Unit, contractors have averaged, on recent wells, 48 days from spud to spud and 34 actual drilling days.

**Roads.**—The rough terrain in the Sussex area makes road and location work a special problem. Dirt work, including stub roads to locations, has cost from $3,000 to $5,000 per well. A main road 10½ miles long has been built to facilitate transportation between the producing area and the state highway.

The best surfacing material available in the vicinity is scoria. The main road has a 6-in.-thick scoria base with an oil penetration and sand gravel seal. The cost of this type of road, exclusive of right-of-way, is about $10,000 per mile.

### Production Equipment

Continental Oil Co. is constructing an electric generating plant to supply power for pumping wells and operating facilities. This plant will have three 180-hp. engines with direct-connected generators. Cooling equipment will be of the "vapor phase" type The power will be generated at 4,160 volts and transmitted through primary lines at 13,200 volts and secondary lines at 480 volts.

Paraffin accumulations have been troublesome in the Shannon and Wal Creek producing wells and associated facilities. Rod-rotating equipment and

particularly when setting casing or liners in a tight hole, by running a Baker Rotary Wall Scraper. It provides a safe, positive, low-cost method of enlarging the diameter of an open hole for cleaning up oil sands and increasing the productive area; for gravel packing; for directional drilling and sidetracking. Seven basic body sizes provide for hole enlargement from 4¾" minimum to 36" maximum by progressively changing to larger blades.

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paraffin scrapers have been installed in these wells and are satisfactorily controlling this difficulty.

Use of centralized tank batteries and treating facilities is the usual practice in the field. Individual flow lines are laid from each well to the central battery, and manifolds, separators, and meters are installed to facilitate well testing.

All crude is now being bought by Stanolind Oil Purchasing Co. Part is transported through Service Pipe Line, which has an 8-in. line from Salt Creek to the area, and it is their plan to connect all batteries eventually. Some production is being trucked to Salt Creek where all the oil is moved by Stanolind through their line to Casper. Stanolind is now purchasing 100 bbl. per day per producing well.

### Reservoir Engineering

**"A" area.**—Early reservoir performance in the Lakota sand in the "A" area is shown in Fig. 2. Initial pressure in the Lakota sand in the "A" area was 3,470 psi. at datum of 2,670 ft. below sea level. By January 1950, this reservoir had produced 236,000 bbl. of oil, and the pressure had declined to 2,553 psi. The production in February 1950 was 828 bbl. per day with a gas-oil ratio of 452 cu. ft. per barrel.

Fig. 3 shows the cumulative oil and gas production from this reservoir. The cumulative oil production to February 28, 1950, was 259,365 bbl., and the cumulative gas production was 112,352 M.c.f.

The reservoir oil is undersaturated, having a bubble point of 1,447 psi. The solution gas-oil ratio by differential liberation is 528 cu. ft. per barrel. The reservoir volume factor at bubble-point pressure is 1.3439.

The Lakota sand in the "A" area varies in gross thickness from 40 to 60 ft. with net thicknesses of from 20 to 50 ft. The average porosity is 17 per cent. Permeabilities vary from 1 to 214 md. with an average of about 65.

**"B" area.**—The Lakota sand and the reservoir oil in the "B" area have characteristics similar to those in the "A" area, but the sand thickness is less. In this area, the gross thickness varies from 18 ft. to 46 ft., and the net thickness varies from 13 ft. to 30 ft.

Fig. 4 shows the early reservoir performance in the Lakota sand in the "B" area. The initial pressure in this area was 3,365 psi. at a datum of 2,340 ft. below sea level. By January 1950, when the Lakota "B" reservoir had produced 116,000 bbl. of oil, the pressure had declined to 2,271 in well No. 5. Initial pressures of wells recently completed have been higher than the pressure in well No. 5, indicating that pressures in this reservoir do not equalize quickly.

Fig. 5 is a plot of the cumulative oil and gas production from the Lakota "B" reservoir. By February 28, 1950, this reservoir had produced 129,618 bbl. of oil and 50,093 M.c.f. of gas.

**Shannon sand.**—Production data on the Shannon sand reservoir in the "A" area are plotted on Figs. 6 and 7. The initial pressure in well No. 4, the first well completed in this reservoir, was 1,820 psi. By January 1, 1950, when this reservoir had produced about 25,000 bbl. of oil, the pressure had declined to 1,340 psi.

The Shannon oil is undersaturated, having a bubble-point pressure of 1,171 psi. The solution gas-oil ratio by differential liberation is 363 cu. ft. per barrel, the reservoir volume factor at bubble-point pressure is 1.21.

The Shannon sand has a gross thickness of about 30 ft., of which about 25 ft. is pay. Core data from one well indicate an average porosity of 17.6 per cent and a permeability range from less than 1 md. to 685 md., with an average of about 50.

The Shannon sand in the North Meadow Creek area has gross thickness varying between 20 and 29 ft. No other reservoir data are available on this sand.

**Sussex sand.**—The Sussex sand in the "A" area has been proven productive by drill-stem tests, but no reservoir data are available. This sand has a gross thickness of about 40 ft. and a net pay thickness of about 25 ft.

In the North Meadow Creek area, the Sussex sand varies in gross thickness from 56 to 60 ft. Estimated net thickness varies from 42 to 57 ft. Approximate average porosity is 19 per cent, and approximate average permeability is 40 md. The initial bottom-hole pressure was 1,474 psi. at 3,900 ft. Bubble-point pressure of the reservoir oil is 1,353 ft. The reservoir volume factor of the bubble-point oil is 1.219. The solution gas-oil ratio determined by differential liberation is 412 cu. ft. per barrel.

# BOOKS

BIBLIOGRAPHY OF ORGANIC REEFS, BIOHERMS, AND BIOSTROMES. Published by Seismograph Service Corp., Tulsa. 139 pp.

This volume was prepared for the benefit of geologists and geophysicists, and it contains over 1,000 references in geological and geophysical literature relating to reef structures. References are complete and are crossindexed by author, geographic location, geologic age, and subject. This new book is the fifth of a series of exploration aids published by S.S.C. for the oil industry.

TECHNICAL PUBLICATIONS, 1947. Published by Standard Oil Co. (N. J.) and affiliated laboratories. 500 pp.

This is the second annual volume of papers written for technical magazines by Jersey personnel. There are a score of papers, having to do with geology and production research, manufacturing research, production research, and analysis. The book has been widely distributed and is available for reference purposes at the larger colleges and universities, public libraries, and industrial research laboratories in the United States, and at some similar organizations in foreign countries.


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In recent years, aluminum and aluminum alloys have grown rapidly in importance as piping materials in many industries, including manufacturers of chemicals, foods, soaps and cosmetics, petroleums, textiles, explosives, rubber, paints and varnishes.

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For example, in chemical plants, aluminum offers great resistance to corrosion, and it is passive to a large number of corrosive fluids where other metals tend to catalyze. Its corrosion products do not cause discoloration. This is important where maintenance of product color is of primary importance.

In food plants, aluminum resists the corrosive action of most food products such as acetic and nitric acids, oils, milk, beer, and fruit juices. It protects against color contamination and helps prevent rancidity.

In the petroleum industry, aluminum piping resists the corrosive action of hydrogen sulfide, sour crude oils, mineral oils and liquid fuels.

Aluminum piping materials are available in a variety of alloys including 2S, 3S, 61S, 63S, and Alclad 3S. Each is particularly suited for certain applications. And, since the physical properties vary with each alloy used, individual applications should be analyzed carefully to determine the correct alloy needed for the job.

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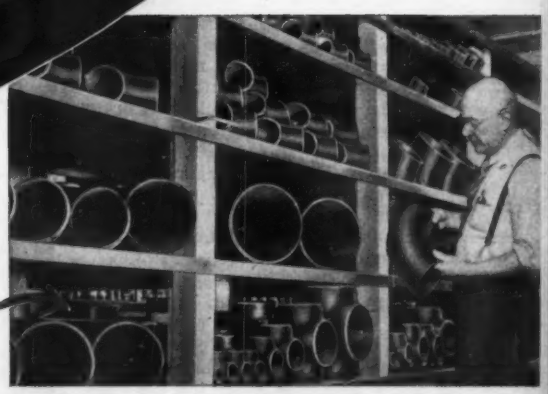

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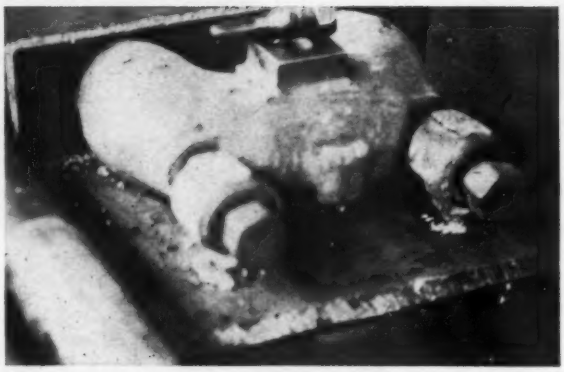
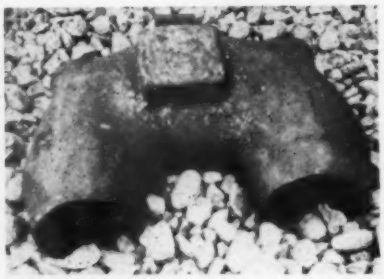


*Right: Here the return bend has the boss machined and tapped for thermocouple connection. The bend is shown here mounted on a shop-built fixture.*

*Below: Return bend with its rough stainless-steel builtup boss, before machining and tapping for thermowell.*



## Return Bend Fitted With Boss for Thermocouple Connection

WHERE thermal decoking of heater tubes is practiced, temperature inspection may be simplified by installing thermocouples in the return bends. Preparation of the return bends for installing the thermocouples consists of building up a stainless-steel boss, by arc welding, which is milled, drilled, taper reamed and tapped for the thermowell, on as many return bends as necessary to cover the heater for complete control.

Duplicate return bends are prepared so that, when the unit is brought down, they can be quickly installed to obtain full use of them without waiting for a shutdown and then building up the bosses on several bends. After the bends have been selected and punch-marked for the location of the boss, the welder applies as many beads as necessary to obtain the desired boss thickness for the thermocouple connection. In order that excess metal be eliminated as far as possible, the welder builds up the boss as closely to the finished shape as skill permits. The rough weld is approximately square and flat on top so the machinist can mill it down quickly.

So the bend may be easily placed in a milling machine, or chucked in a lathe, it is placed on a fixture. This fixture is made of plate consisting of two pieces. The base is large enough to allow adequate space on all sides of the bend for protection. The other part is slightly wider than the bend is deep and is welded to the base at a 90° angle. Threaded eyebolts are attached to the base so that hexagon heat set screws hold the return bend solidly in the desired position until all machine work has been completed.

## Diesel Fuel Treated Hot From Fractionator

TREATING of straightrun products distilled from California crudes as they come from the fractionators is being successfully accomplished by McCallan Refining Co., Huntington Beach, Calif. The method has been employed for some time at this refinery.

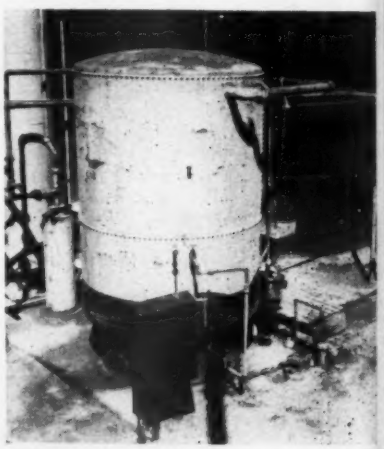
Prior to installing a "hot stream" treating method, straightrun gasoline and diesel fuel were both condensed and cooled to the lowest practicable temperature and run to storage, from where the material was pumped in a more or less batch operation to caustic wash vessels.

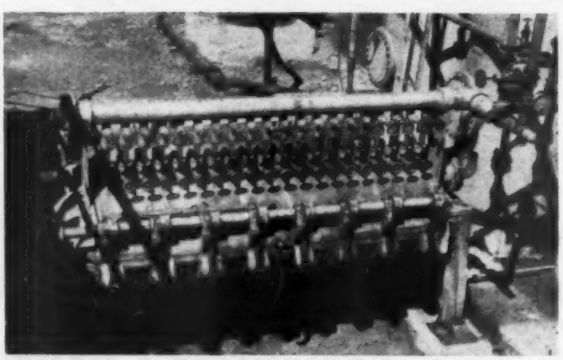
The diesel fuel had a tendency to darken in storage when treated by normal methods, but when contacted with caustic while warm the color is stable and samples several months old can be distinguished from a freshly run product only with difficulty. The vessel used for diesel-fuel treating is approximately 8 by 10 ft. and contains a cross-shaped spider near the floor. Each log of the spider is perforated with two rows of holes; each pair of rows are separated at an angle of about 70° to obtain turbulence and contact between the oil and the caustic solution in the base of the vessel.

To obtain the desired temperature for treating in the "hot phase," the original coolers are partly bypassed by the overhead vapors so that material will enter the caustic scrubber at approximately 130° F. These vapors are produced from the plant fractionator under a pressure of 20 psig. and flow directly to the caustic drum where a pressure of 12 psig. is maintained.

Treated product flows from the contactor through a 20-leaf filter to remove any trace of caustic which may be carried over with the diesel fuel. The leaves of the filter are covered with Corning spun-glass cloth which has been found resistant to deterioration when employed in this service. Common cotton and felt covers were frequently replaced due to breaking down to a point where filtration was nullified.

Straightrun gasoline is produced from the fractionator overhead and cooled only enough to condense most of the product which then flows through a caustic contact drum similar in construction to that used for diesel fuel. The stream of gasoline is then piped to after-coolers to the lowest possible temperature obtainable. Tower pressures are suitable for passing the products through the caustic contactors.





*Above: Caustic contactor vessel through which McCallen Refining Co., Huntington Beach, Calif., treats diesel fuel directly from column stream.*

*Left: Leaves of the filter are covered with Corning spun glass fabric, to separate traces of caustic from the treated diesel fuel.*

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# CAPACITORS

## for outdoor oil-well pumping motors

**Q.** *What's new about these G-E outdoor capacitors?*

**A.** In this new line, they now match the kvar requirements of small oil-field pump motors more closely than ever before.

**Q.** *How does the new price compare with the old?*

**A.** Price per kvar is 20 to 50 per cent less than the special ratings previously available for outdoor capacitors. New list prices range from $48 to $92.

**Q.** *What ratings are available?*

**A.** Made for 3- to 15-hp motors, the capacitor ratings are 2, 3, 4, 5, and 6 kvar, for 460-volt, 3-phase, 60-cycle operation.

**Q.** *What extras do I need?*

**A.** None. Each unit comes complete with a 4-foot flexible, watertight cable which can be used with or without conduit. Heavy-gage steel case is also watertight and durably finished to resist rust and corrosion. Unit operates on motor-starter switch.

**Q.** *How are they mounted?*

**A.** Small size of unit and holes in end flanges permit quick, easy mounting on motor well pole or service pole for direct connection to motor starter.

For full information on these new outdoor capacitors, or any other oil-field electric equipment, contact your local G-E representative. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

## HOW CAPACITORS CUT YOUR COSTS

Power factor is usually low in oil-well pumping because of the cyclic load of pumping jacks. The jacks are overmotored, which results in low field power factor. To improve power factor, capacitors are your best bet. Here are some of the advantages they can bring you:

**Release system capacity** Capacitors may enable your present distribution system to carry 20 to 30 per cent more load without added equipment. On new systems, they permit use of smaller transformers and conductors, which more than offsets capacitor cost.

**Improve voltage level** If voltage drop is a problem, or you must add more wells or larger motors to an already fully-loaded system, capacitors can inexpensively provide the needed voltage boost.

**Reduce power losses** This saving alone may mean a 10 to 20 per cent annual return on capacitor investments.

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# PROGRESS in METALS

by W. L. Nelson
Consulting Engineer

## Summary of Gray Iron Specifications

THE Gray Iron Founder's Society, Inc., of 210 National City, East Sixth Building, Cleveland, has done a signal service to industry by compiling a summary of the various specifications of gray iron. Director Charles O. Burgess of the technical department has been in charge of the work. The summary covers only the gray iron specifications promulgated by the following universally recognized specifying bodies.

A.A.R.—Association of American Railroads.
A.B.S.—American Bureau of Shipping.
A.M.C.C.W.—Association of Manufacturers of Chilled Car Wheels.
A.P.I.—American Petroleum Institute.
A.R.E.A.—American Railway Engineering Association.
A.S.A.—American Standards Association.
A.S.M.E.—American Society of Mechanical Engineers.
A.S.T.M.—American Society for Testing Materials.
A.T.A.—American Transit Association.
Federal—United States Government and Army.
M.S.S.—Manufacturers Standardization Society of the Valve and Fittings Industry.
Navy—Navy Department.
N.B.F.U.—National Board of Fire Underwriters.
S.A.E.—Society of Automotive Engineers.

Table 1, shown on this page, is an index of the specifications of the several agencies.

## Low-Carbon Steel at Elevated Temperatures

THE most common structural material now in use is ordinary low-carbon steel. Many millions of tons of this material are in use. This material oxidizes relatively rapidly, even at ordinary temperatures and under ordinary conditions, and, of course, can be protected under these conditions by painting or other means of coating. However, as the conditions of its environment change, its properties also change.

As temperatures rise, the oxidation rate of low-carbon steel increases and its structural strength decreases, until at temperatures of around 1,000° F. it becomes practically unusable. For example, at 1,400° F., a 0.30 carbon steel will oxidize in air at the rate of nearly 1/16 in. per 100 hours. At the same time, its load-carrying ability will decrease from a safe stress figure of say 25,000 or 30,000 psi. at room temperature, to less than 500 psi. at 1,400°. So it becomes obvious that some other material must be used under such conditions.

(From paper, "Metallurgy for High-Temperature, High-Sulfur Process Conditions," by F. M. Fahrenwald, Fahrelloy Co., Harvey, Ill.)

**TABLE 1—INDEX OF GRAY IRON SPECIFICATIONS CONTAINED IN TABULATION**

| Type of casting— | Specifying or concurring bodies | Specification |
|---|---|---|
| General castings | A.S.T.M., A.A.R., Federal A.B.S., A.P.I., A.R.E.A. A.S.M.E., N.F.B.U., S.A.E. | A.S.T.M. A48-48 |
| | A.S.T.M., A.A.R., A.P.I. A.R.E.A., A.S.A. | A.S.T.M. A190-47 |
| | Federal | QQ-1-652 |
| | Navy | 46-1-6c |
| | Navy | 46-1-5c |
| | A.B.S. | 40-93 |
| Automotive castings | A.S.T.M., S.A.E. | A.S.T.M. A159-49T |
| Pressure-containing castings for use at high temperatures | A.S.T.M. | A-278-44T |
| Nonpressure containing castings for use at high temperatures | A.S.T.M. | A.S.T.M. 319-48T |
| Gray iron alloy castings (scale resisting) | Navy | 46-1-9 |
| Railroad castings | A.A.R. | M-401-44 |
| | A.A.R. | M-403-44 |
| | A.T.A. | W104-37 |
| Pipe castings | A.S.T.M., A.S.A. | A.S.T.M. A44-41 |
| | A.S.T.M. | A74-42 |
| | A.S.T.M., A.S.A. | A.S.T.M. A142-38 |
| | Federal | WW-P-356 |
| | Federal | WW-P-401 |
| | Federal | WW-P-421 |
| Pipe fittings, valves, flanges | A.S.T.M., A.S.A. | A.S.T.M. A126-42 |
| | Federal | WW-P-491 |
| | Federal | WW-P-501-B |
| | Federal | WW-V-58 |
| | Navy | 46F3f |

(Also see A.S.T.M. A74-42 and Fed. WW-P-401 above.)

Note: Many large companies—as John Deere, International Harvester, General Motors, Fairbanks-Morse, Caterpillar Tractor, etc.—have own individual casting specifications that must be consulted by suppliers.

## Mounting Metallurgical Specimens

A NEW method of mounting metallurgical specimens has recently been developed by Denton L. Smith of the National Bureau of Standards. A temperature only slightly above room temperature is required and it is not necessary to apply external heat.

In common mounting procedures, the specimen must be heated to a high temperature under pressure, and this sometimes causes recrystallization or change in the structure of the metal. The equipment employed is usually expensive. In contrast, the Bureau of Standards method can be completed in 15 to 30 minutes, depending on the room temperature, and no special equipment is required except an inexpensive mold and a clamp or vise.

A modified acrylic resin (also used for dentures) is used as the mounting. This material consists of a mixture of polymer and a monomer which will polymerize or set under pressure at room temperature. The heat generated by the polymerization reaction can be controlled by varying the amount of resin employed. The new procedure permits the mounting of a wide variety of specimens for microscopic study without disturbing the crystalline structure.

## Pipe Fabrication Standards

ENGINEERS and manufacturers have not always employed the same practices in the fabrication of piping. To assist in the adoption of standards, the Pipe Fabrication Institute, 1108 Clark Building, Pittsburgh, has issued the following four standards:

ES-1-1948—Machined backing rings and end preparation for butt welds.

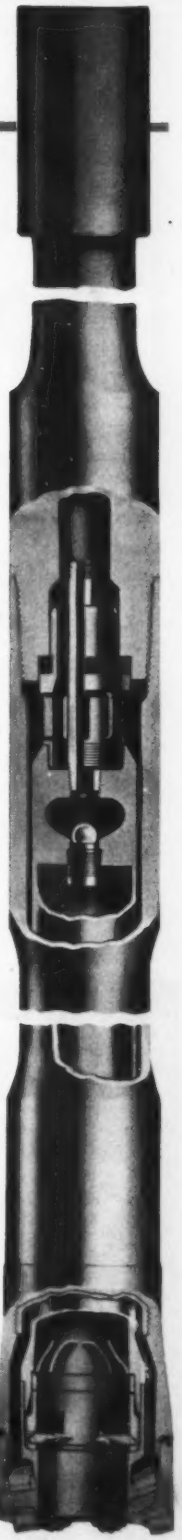
ES-2-1949—Method of dimensioning welded assemblies.

ES-3-1949—Linear tolerances, bending radii, minimum tangents.

ES-4-1949—Standard practice—shop hydrostatic testing of fabricated piping.

Use of the new standards is purely voluntary, but it is felt that an adherence to them will assist designers, fabricators, and purchasers in understanding one another.

# here's one reason why operators prefer



# REED

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# CORE DRILLS

This slush-lubricated bearing is smooth running, long lasting and easy to replace. Since it can be replaced *at the rig* it helps keep your core barrel out of the repair shop.

But the biggest advantage of Reed Kor-King Core Drills is the fact that they *consistently recover a higher percentage of good cores!* That is why operators everywhere specify the Reed Kor-King for all their coring jobs.

**REED ROLLER BIT COMPANY**

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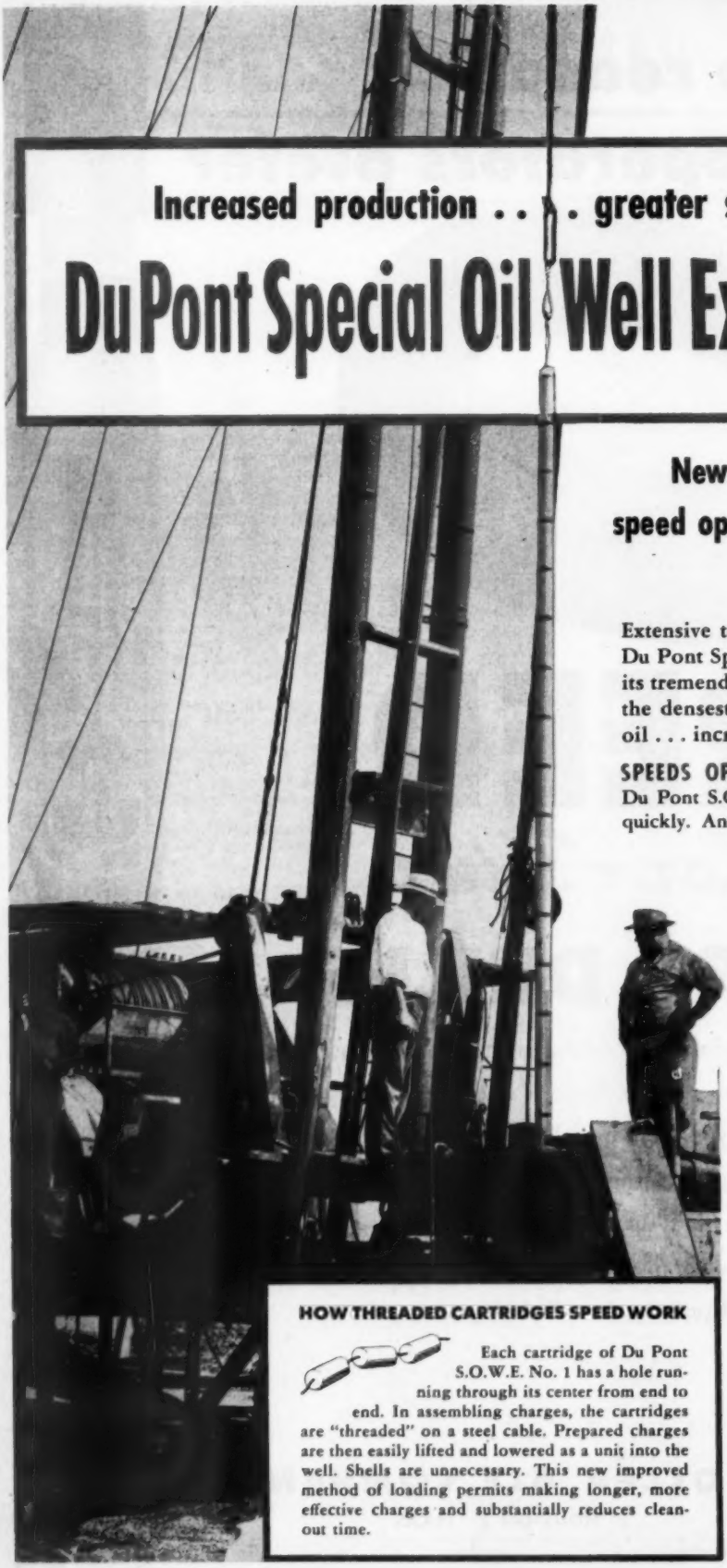
## Increased production . . . greater safety with

# Du Pont Special Oil Well Explosive No. 1



### New easy-to-load cartridges speed operations . . . reduce hazards . . . cut costs

Extensive tests in many fields have proved that Du Pont Special Oil Well Explosive No. 1, with its tremendous spreading action, permeates even the densest strata to promote a greater flow of oil . . . increase production.

**SPEEDS OPERATIONS.** Easy-to-load cartridges of Du Pont S.O.W.E. No. 1 are threaded on the cable quickly. And because of the greater weight load carried, the number of entries into the hole is greatly reduced. Torpedo shells are not needed, and clean-out is facilitated by the elimination of this metal.

**REDUCES HAZARDS.** Du Pont S.O.W.E. No. 1 is the safest well explosive known . . . so safe, in fact, that even the impact of a high-powered rifle bullet won't detonate it. It contains no nitroglycerin, is easy to handle.

Your American Glycerin Section representative will be glad to tell you more about the advantages of using Du Pont Special Oil Well Explosive No. 1.

**HOW THREADED CARTRIDGES SPEED WORK**



Each cartridge of Du Pont S.O.W.E. No. 1 has a hole running through its center from end to end. In assembling charges, the cartridges are "threaded" on a steel cable. Prepared charges are then easily lifted and lowered as a unit into the well. Shells are unnecessary. This new improved method of loading permits making longer, more effective charges and substantially reduces clean-out time.

## AMERICAN GLYCERIN SECTION

*Explosives Department*

E. I. du Pont de Nemours & Co. (Inc.),
Tulsa 3, Oklahoma

DU PONT
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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

# Cost-imating

## Construction Costs Rise Slowly

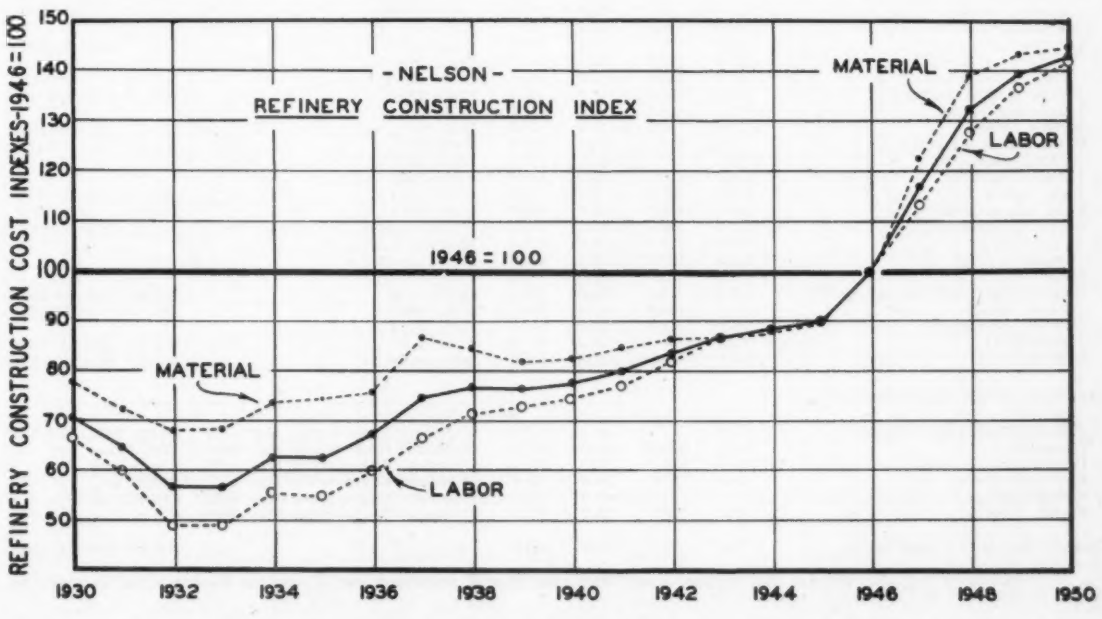
MATERIALS used in refinery construction continue to rise slowly in price. Iron and steel costs have risen by 2-3 per cent since 1949, composite building materials by about 1 per cent, and the costs of machinery, instruments, and electrical equipment remains steady. About 60 per cent of the equipment items carried currently in Cost-imating have increased in price since 1949 and about 35 per cent have decreased in price. However, some contracts have been taken at lower prices because fewer plants are being constructed. To a large extent the increases in materials cost are due to steel and to lumber, particularly cypress and redwood.

Wage rates are still rising and each increase now represents an increase in real income because living costs are somewhat constant or decreasing slightly. The Bureau of Labor Statistics shows that the price of 900 commodities is lower by 3 or 4 per cent than for a year ago, and about 10 per cent lower

**INDEXES OF COMPONENTS USED IN THE NELSON REFINERY CONSTRUCTION INDEX (1946 = 100)**

| Year | Iron and steel* | Building materials* | Misc. equipment† | Components material‡ | Labor§ | Nelson index |
|---|---|---|---|---|---|---|
| 1926 | 90.5 | 75.4 | 94.0 | 88.1 | 65.1 | 72.0 |
| 1928 | 81.5 | 71.0 | 89.0 | 80.9 | 64.5 | 71.0 |
| 1929 | 86.0 | 72.0 | 87.0 | 83.3 | 64.5 | 72.0 |
| 1930 | 78.5 | 68.0 | 84.0 | 77.5 | 66.5 | 70.3 |
| 1931 | 73.0 | 60.0 | 82.0 | 72.2 | 60.0 | 64.9 |
| 1932 | 69.0 | 54.0 | 79.0 | 68.0 | 49.0 | 56.6 |
| 1933 | 69.0 | 58.0 | 76.0 | 68.2 | 49.0 | 56.7 |
| 1934 | 76.0 | 65.0 | 74.0 | 73.4 | 55.5 | 62.7 |
| 1935 | 77.0 | 64.0 | 76.0 | 74.2 | 55.0 | 62.7 |
| 1936 | 79.0 | 65.0 | 77.0 | 75.8 | 60.0 | 67.3 |
| 1937 | 94.0 | 72.0 | 80.0 | 86.8 | 66.5 | 74.6 |
| 1938 | 91.5 | 68.0 | 81.0 | 84.7 | 71.5 | 76.8 |
| 1939 | 87.0 | 68.0 | 82.0 | 82.0 | 73.0 | 76.6 |
| 1940 | 86.0 | 71.0 | 83.0 | 82.3 | 74.5 | 77.6 |
| 1941 | 87.0 | 78.0 | 84.0 | 84.6 | 77.0 | 80.0 |
| 1942 | 88.0 | 83.0 | 85.0 | 86.3 | 82.0 | 83.7 |
| 1943 | 88.0 | 84.0 | 86.0 | 86.7 | 86.5 | 86.6 |
| 1944 | 88.0 | 87.0 | 88.0 | 87.6 | 88.5 | 88.1 |
| 1945 | 90.0 | 89.0 | 90.0 | 89.7 | 90.0 | 89.9 |
| 1946 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1947 | 121.0 | 135.5 | ‖114.2 | 122.4 | 113.5 | 117.0 |
| 1948 | ‖140.5 | 153.0 | ‖122.1 | ‖139.3 | 128.0 | 132.5 |
| 1949 | ‖150.2 | ‖145.8 | ‖121.6 | 143.6 | 137.1 | ‖139.7 |
| 1950 est. | 153.0 | 146.0 | 120.0 | 145.0 | 142.0 | 143.0 |

*"Wholesale Prices," U. S. Department of Labor, Bureau of Labor Statistics, published weekly. †An average taken from Cost-imating No. 1, October 21, 1948, and from manufacturers published in the first monthly issue of The Oil and Gas Journal. ‡Weighted as 60 per cent iron and steel, 20 per cent each of building materials and of miscellaneous equipment. §Half and half skilled and common construction labor from Engineering News Record. ‖Revised.



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than the high of August 1948. Although wages are still increasing, the rate of increase is slowing down. This is probably a reflection of the fact that many unions have signed contracts that do not allow wage increases this year, or are willing to settle without wage increases. If the matter of pension and welfare plans was not overhanging the situation, it could be concluded that a balanced state of construction costs was in prospect.

### Petroleum-Products Prices and Indexes

The Bureau of Labor Statistics. U. S. Department of Labor, in March 1950 announced its revised and enlarged listings on petroleum products, crude oils, and lubricating oils. The description of the new listings and the changes is entitled "Primary Market Prices and Indexes for Petroleum and Products." The new listings were introduced into the monthly "Average Wholesale Prices and Index Numbers of Individual Commodities" of the Bureau of Labor Statistics in November 1949.

The Petroleum and Products items were increased from 9 to 16, including 4 on gasoline, 3 on kerosine, 4 on distillate fuels, and 1 listing of natural gasoline. The Crude Petroleum items were increased from three to five. The two new listings are West Texas, sour, 34°-34.9° gravity, and Gulf Coast, Hastings, and other crudes, 33°-33.9° gravity. The lubricating-oil listings have been increased from four to seven.

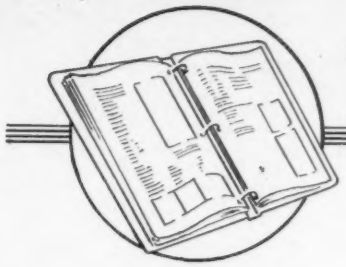
Only prices (not indexes) are appearing now in the monthly publication "Average Wholesale Prices and Index Numbers . . ." because of the new listings and the new weighting or proportioning that was necessary. Accordingly, Special Indexes for Petroleum and Products based on 1947 as 100 have been prepared for the years 1946-1949 inclusive.

The Special Indexes are also being carried weekly and monthly in the Wholesale Prices index releases until the new base period can be adopted.

**CURRENT ITEMIZED COST INDEXES**
**Indexes Based on 1946 = 100**

| Labor: | 1947 | 1948 | 1949 | March 1950 | Reference* | Complete index appears in Cost-imating |
|---|---|---|---|---|---|---|
| Skilled construction | 112.0 | 125.0 | 133.9 | 137.2 | Engineering News Record | No. 55—Nov. 3, 1949 |
| Common labor | 115.0 | 131.0 | 140.4 | 143.9 | Engineering News Record | No. 55—Nov. 3, 1949 |
| Refinery construction | 113.5 | 128.0 | 137.1 | 140.5 | | No. 61—Dec. 15, 1949 |
| Refinery operation | 109.0 | 126.0 | 132.9 | †137.0 | Survey of Current Business | No. 55—Nov. 3, 1949 |
| Equipment or materials: | | | | | | |
| Board, insulation, 48-in. | 112.5 | 125.0 | 125.1 | 124.9 | Core 561 | |
| Boiler tubes, 2-2¼ in. | 115.0 | †135.0 | 140.9 | 148.3 | Code 409.2 | |
| Brick and tile composite | 114.0 | 137.0 | 131.4 | 132.8 | Composite | No. 22—Mar. 17, 1949 |
| Brick, common | 110.5 | 127.0 | 133.1 | 133.5 | Code 498.1 | |
| Brick, fireclay | 114.0 | 126.0 | 131.3 | 141.4 | Code 499 | |
| Building materials composite | 135.5 | 153.0 | 145.8 | 146.3 | Composite | No. 22—Mar. 17, 1949 |
| Castings, gray iron | 118.5 | †139.5 | †141.5 | | Code 416.7 | No. 46—Sept. 1, 1949 |
| Castings, pipe | 129.0 | †180.0 | 173.8 | 171.2 | Code 434.2 | No. 46—Sept. 1, 1949 |
| Cement | 111.0 | 125.0 | 128.2 | 129.6 | Code 509 | No. 22—Mar. 17, 1949 |
| Compressor | 114.0 | 128.0 | 120.0 | 117.0 | Manufacturer | No. 36—June 23, 1949 |
| Engines (composite) | 109.0 | 120.0 | 115.5 | 113.2 | Manufacturer | No. 36—June 23, 1949 |
| Gas | 111.0 | 122.0 | 117.0 | 115.0 | Manufacturer | No. 36—June 23, 1949 |
| Diesel | 108.0 | 117.0 | 114.0 | 111.5 | Manufacturer | No. 36—June 23, 1949 |
| Exchangers | †115.0 | †130.0 | †133.0 | | | No. 2—Oct. 28, 1948 |
| Instruments (composite) | 113.0 | 120.0 | 123.1 | 123.1 | Manufacturer | No. 34—June 9, 1949 |
| Flow meter, mechanical | 102.0 | .... | 109.2 | 109.2 | Manufacturer | No. 34—June 9, 1949 |
| Flow meter, air control | .... | .... | 132.4 | 132.4 | Manufacturer | No. 34—June 9, 1949 |
| Flow meter, remote | .... | .... | 130.2 | 130.2 | Manufacturer | No. 34—June 9, 1949 |
| Potentiometer, 6-pt. | 111.0 | .... | 125.8 | 130.0 | Manufacturer | No. 34—June 9, 1949 |
| Potentiometer, air control | .... | .... | 131.6 | 131.6 | Manufacturer | No. 34—June 9, 1949 |
| Pressure controller | .... | .... | 130.2 | 130.2 | Manufacturer | No. 34—June 9, 1949 |
| Pressure gage | 109.0 | .... | 100.0 | 100.0 | Manufacturer | No. 34—June 9, 1949 |
| Thermometer, recording | .... | .... | 118.6 | 118.6 | Manufacturer | No. 34—June 9, 1949 |
| Control valve | 117.0 | .... | 129.8 | 129.8 | Manufacturer | No. 34—June 9, 1949 |
| Insulation, asbestos pipe | 118.0 | 122.0 | 130.1 | 130.1 | Code 767 | |
| Lumber (composite) | 155.0 | 175.0 | 160.1 | 165.9 | Composite | No. 7—Dec. 2, 1948 |
| Cypress, C grade | 155.0 | 178.0 | 213.5 | 247.1 | Code 529-2 | |
| Pine, Ponderoso No. 3 | 140.0 | 176.0 | 159.0 | 158.8 | Code 524-1 | |
| Pine, yellow timbers | 138.0 | 161.0 | 154.8 | 156.6 | Code 522-9.1 | No. 7—Dec. 2, 1948 |
| Redwood, heart | 134.0 | †159.0 | 154.6 | 171.1 | Code 528-3 | |
| Motors, electric | 110.0 | 112.7 | 114.0 | 129.0 | Manufacturer | No. 31—May 19, 1949 |
| Paint and paint materials | 137.0 | 135.0 | 127.5 | 115.9 | Composite | No. 22—Mar. 17, 1949 |
| Paint, inside, flat | 133.5 | 137.0 | 147.0 | 142.7 | Code 531.1 | |
| Paint, outside | 150.0 | †156.0 | 157.0 | 146.3 | Code 532.1 | |
| Pipe, sewer | 111.5 | 121.5 | 119.1 | 121.6 | Code 572.1 | No. 22—Mar. 17, 1949 |
| Pipe, black, ¾-in. | 120.5 | †148.0 | 152.2 | 158.8 | Code 435.1 | No. 42—Aug. 4, 1949 |
| Pump (composite) | 118.7 | 129.1 | 131.7 | 129.3 | Manufacturer | No. 29—May 5, 1949 |
| Centrifugal | 109.0 | 120.0 | 118.9 | 119.0 | Manufacturer | |
| Reciprocating | 128.5 | 138.1 | 144.6 | 139.6 | Manufacturer | |
| Sand | 112.0 | 122.0 | 127.4 | 127.8 | Code 579.2 | |
| Steel (composite Iron and Steel) | 121.0 | 140.5 | 150.2 | 153.0 | Composite | No. 61—Dec. 15, 1949 |
| Plate (tank) | 117.5 | †144.0 | 144.5 | 150.9 | Code 446.3 | No. 5—Nov. 18, 1948 |
| Sheet, galvanized | 105.0 | †146.0 | 139.0 | 142.1 | Code 448.3 | |
| Structural | 113.5 | †145.0 | 151.3 | 161.8 | Code 452.2 | No. 18—Feb. 17, 1949 |
| Transformers | 116.0 | 116.0 | 116.0 | 116.0 | Manufacturer | No. 31—May 19, 1949 |
| Marshall-Stevens equipment (only) indexes: | | | | | | |
| Process industries (average) | 121.0 | 131.5 | 131.5 | 130.9 | Chemical Engineering May 1950 | Chem. Eng., Feb. 1950 |
| Chemical | 119.5 | 130.0 | 130.0 | 129.2 | Chemical Engineering May 1950 | Chem. Eng., Feb. 1950 |
| Petroleum | 121.0 | 132.0 | 132.0 | 131.4 | Chemical Engineering May 1950 | Chem. Eng., Feb. 1950 |
| Electrical power | 122.0 | 135.0 | 135.0 | 134.4 | Chemical Engineering May 1950 | Chem. Eng., Feb. 1950 |
| Refrigeration | 129.9 | 141.0 | 139.9 | 138.3 | Chemical Engineering May 1950 | Chem. Eng., Feb. 1950 |
| Steam power | 122.0 | 132.0 | 132.0 | 131.2 | Chemical Engineering May 1950 | Chem. Eng., Feb. 1950 |
| Nelson—Refinery Construction | 117.0 | 132.5 | 139.6 | 142.6 | | No. 61—Dec. 15, 1949 |

*The reference for all codes, or for composite, is "Wholesale Prices" published monthly by the Bureau of Labor Statistics, U. S. Department of Commerce. †Estimate.



# THE REFINER'S notebook

# Proportional Band

CORRECTIVE action of pneumatic controllers with different modes of control was indicated in the previous installment of The Refiner's Notebook. In proportional control when a sustained process load change takes place the amount of offset or sustained deviation of the value of the controlled variable from the desired value depends on the proportional band. With a wider band a greater deviation of offset is obtained. For this reason it is desirable to use a small proportional band. An overly narrow proportional or throttling band, however, may result in cycling, due to the greater corrective action.

### Narrow and Wide Bands

The proportional band is the range of the values of the controlled variable corresponding to the full operating range of the final control element. Since in proportional control the change in controller output pressure is proportional to deviation or change in the value of the controlled variable from the desired value, the proportional band is expressed directly as a percentage of the full controller scale range corresponding to the full stroke of the valve from completely open to completely closed. A proportional band of 50 per cent means that the valve goes through its full travel when the controlled variable change 50 per cent of the full-scale range. With a wide band the full valve stroke is obtained upon a large change in the controlled variable while with a narrow throttling range full valve movement corresponds to a small change in the controlled variable. A narrow band is ordinarily thought of as one which is 10 per cent or smaller. A band greater than that is considered to be a wide proportional band.

The size of band to be used depends on the process. Fig. 1 shows the relation between the controlled variable and controller output pressure for different proportional bands. Note that this is for reverse controller action—increase in the value of the controlled variable results in proportional decrease in controller output pressure. Note also that the lines for different proportional band intersect at the set point. A similar graph may be obtained by plotting valve position in per cent of maximum opening against the pen position in per cent of chart scale range, at different proportional band settings.

To vary the amount of valve opening or closing corresponding to a given change in the controlled variable a manual reset may be used. This changes the set point so that the controlled variable is maintained at the desired value. Fig. 2 shows the effect of adjusting the controller set point for a given proportional band to maintain the desired value. Fig. 2 shows that with a 30 per cent proportional band, if a desired value is to be maintained which is at the midpoint of the controlled variable scale range, the set point will have to be adjusted from 35 to 65 per cent of scale range to obtain required output pressure.

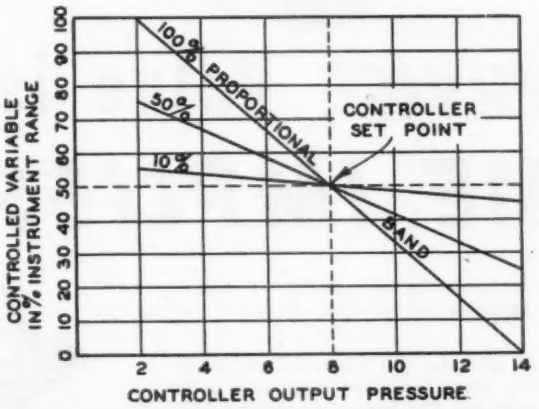



*Fig. 1—Showing relation between controlled variable and controller output pressure for various proportional bands. (Courtesy Mason-Neilan Regulator Co.)*

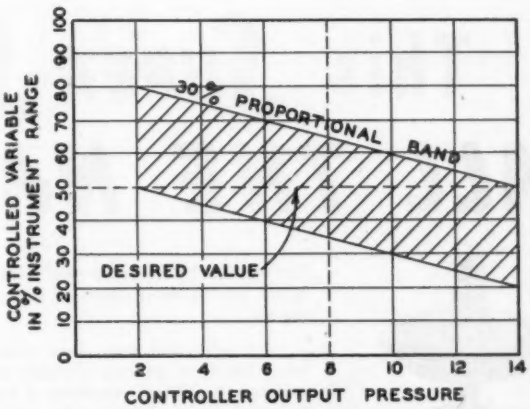

CONTROLLED VARIABLE IN % INSTRUMENT RANGE
0 10 20 30 40 50 60 70 80 90 100
30%
PROPORTIONAL BAND
DESIRED VALUE
2 4 6 8 10 12 14
CONTROLLER OUTPUT PRESSURE

*Fig. 2—Effect of adjusting controller set point. (Courtesy Mason-Neilan Regulator Co.)*

**No. 27 in current series. The Refiner's Notebook has been published continuously since 1944**



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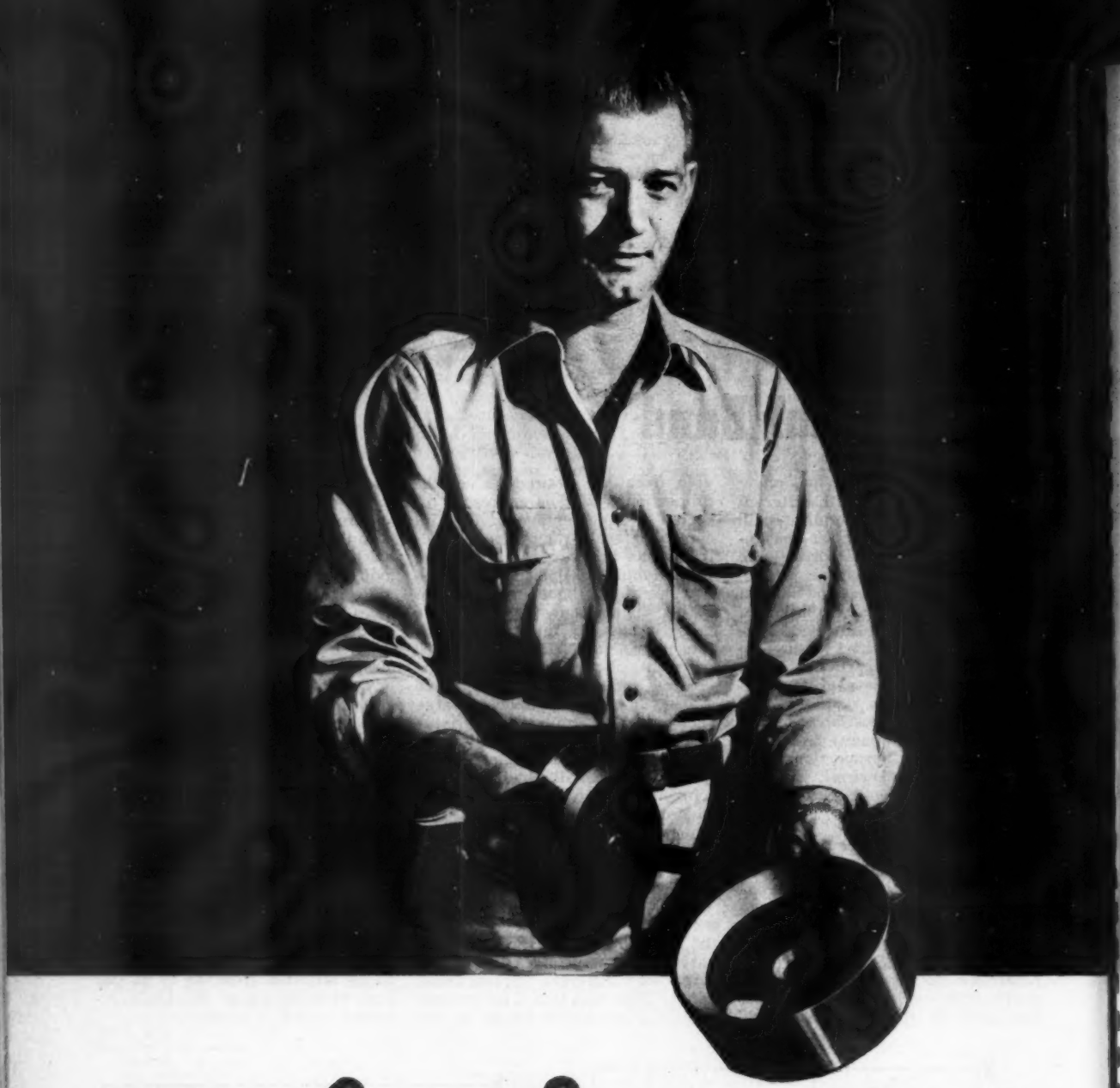

# This SUPER-SERVICE Valve is ALL THE NAME IMPLIES!

MISSION "Super-Service" Slush Pump Valve, for high-pressure service.

**The MISSION "Super-Service" Slush Pump Valve, for *high-pressure* service . . . is all the name implies—a valve of extraordinary strength, efficiency, and durability.**

**In this valve four deep cross arms give the seat extra strength. Extra-large file-hard striking surfaces minimize wear. Extra-long valve stem guide reduces "wobble," resulting in long insert life. Our famous Compound 308* Insert gives 3 to 10 times the service of ordinary inserts . . . Mission Mfg. Co., Houston, Texas. Export Office: 30 Rockefeller Plaza, New York. European Address: London, England.**

*TRADE MARK REG. U. S. PAT. OFF.

**MISSION MANUFACTURING CO.**

MISSION "Silver Top" Slush Pump Valve, for general service.

# Performance of Parallel Reservoirs

IT is necessary in proper reservoir control to have the production measured as it is produced from each individual reservoir. Actual production may often be from two or more separate reservoirs thought to be one, or maybe from two or more reservoirs because mechanical separation cannot be obtained. It is of interest to inquire what the average production performance would look like in such instances. A composite performance can be suggested provided knowledge exists as to how the reservoirs would perform individually. Since they cannot actually be produced individually the expected individual performance must be predicted. This can be done if the reservoirs are assumed to be produced by solution-gas drive.

Let it be assumed that two individual solution-gas-drive reservoirs have the production histories (given as pressure and producing gas-oil ratio versus cumulative production) shown in Figs. 1 and 2. Let it be assumed that these reservoirs produce to a common surface collection point so that at any time the total cumulative production, $C_T$, is the sum of the individual cumulative productions, $C_1$ and $C_2$. Let the total gas produced be $G_T$. It will also be the sum of the gas productions $G_1$ and $G_2$ from the individual reservoirs.

For each of the individual reservoirs the total gas produced when the cumulative oil values are $C_1$ and $C_2$ will be the areas under the producing gas-oil ratio curves, as shown in Figs. 1 and 2. In equation form this is:

$$G_1 = \int_0^{C_1} R_1 dC_1 \qquad (1)$$

$$G_2 = \int_0^{C_2} R_2 dC_2 \qquad (2)$$

The total gas produced must also be equivalent to a similar expression based on the composite reservoir production. This will be:

$$G_T = \int_0^{C_T} R_{AVE} dC_T \qquad (3)$$

Since $G_T = G_1 + G_2$, and the latter are given by Equations 1 and 2, Equation 3 becomes, upon making these substitutions:

$$\int_0^{C_1} R_1 dC_1 + \int_0^{C_2} R_2 dC_2 = \int_0^{C_T} R_{AVE} dC_T \qquad (4)$$

For given values of $C_1$ and $C_2$ the left-hand integrals of this equation are known quantities. The right-hand member can then be evaluated and a solution for $R_{AVE}$ obtained provided the variation between $R_{AVE}$ and $C_T$ is known. This variation can be assumed to be a straight line over small production intervals and the solutions for $R_{AVE}$ can be carried on step by step. Therefore, by Equation 4 and the Figs. 1 and 2, one can solve for the variation of $R_{AVE}$ with the total cumulative oil, for any combination of values of $C_1$ and $C_2$. The variation would necessarily be taken in small increments from the point of zero production to satisfy the linear assumption in evaluating the integrals above. Since there would be an infinite number of combinations of $C_1$ and $C_2$ an infinite number of curves could be obtained.

To plot total cumulative oil versus producing gas-oil ratio for the two reservoirs producing simultaneously, therefore, a relationship between $C_1$ and $C_2$ is necessary. Several assumptions might justifiably approximate actual operating conditions. It might be assumed that production be carried on slowly enough for both reservoirs to be at the same average pressure at all times. Fixing an average pressure would immediately give the relationship between $C_1$ and $C_2$.

Based on the assumption that the reservoirs of Figs. 1 and 2 are always at the same pressure the calculation of $R_{AVE}$, the producing gas-oil ratio, for the reservoirs producing in parallel, is shown in Fig. 3. Note in particular the tendency toward a double hump in the gas-oil-ratio curve. Such a hump is sometimes seen in production data. The pressure decline of Fig. 3 is of course fixed by the basic assumption above. This method can be extended to any number of solution-gas-drive reservoirs in parallel.

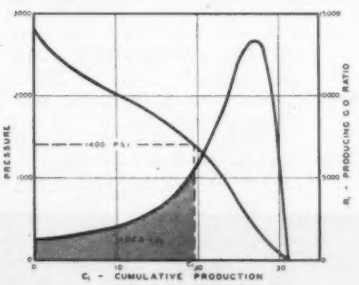


Fig. 1

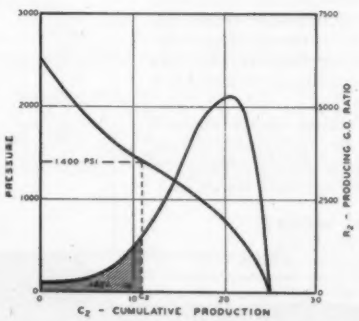


Fig. 2

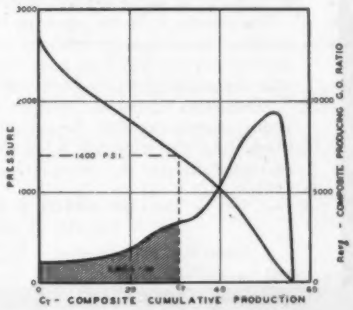


Fig. 3

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma



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# WeldELLS®

## ...There are no fittings like WeldELLS

When we say there are no welding fittings like WeldELLS we feel that we are simply repeating the expressed opinions of thousands who know pipe welding.

Often it is the opinion of a designer who recognizes the engineered strength distribution and closely controlled metallurgy of these fittings that are designed by engineers.

Frequently, it is the opinion of a construction superintendent, maintenance man, or welding foreman who has discovered job-speeding, cost cutting features in WeldELLS that are combined in no other fittings.

Sometimes it is the opinion of those whose unusual requirements can only be satisfied in the broader Taylor Forge line; for in certain sizes, weights and materials it can be truthfully said that *there are no fittings* BUT *WeldELLS!*

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# TAYLOR FORGE

# OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

## TRADE LITERATURE

**1 SECTIONAL DRIVE GROUPS.** A new 12-page, 2-color, illustrated bulletin on Ideal type BL sectional drive groups for type 50 Consolidated rigs covers two and three-section type BL drive groups which have Airflex engine and pump-drive clutches and air-actuated engine throttles which can be remotely controlled from the driller's position. The bulletin includes dimensions and specifications, and dimensional layouts with a listing of applicable engines. *National Supply Co.*

**2 INTERMEDIATE AND HIGH-HEAT-DUTY FIRE BRICK.** Properties are detailed and general characteristics and uses are specified. Information on the facilities of the organization for the production of special fire-clay shapes to meet practically every requirement is included. *Walsh Refractories Corp.*

**3 DUPLEX TUBING TECHNICAL BULLETIN NO. 1950** describes Duplex tubing which is made up of two different metals or alloys inside and outside, each designed to withstand the particular corrosive medium it comes in contact with. *Bridgeport Brass Co.*

**4 KLEMP OPEN STEEL GRATING.** A 24-page, 3-color booklet explains and completely illustrates with actual photographs, the different types of diamond, riveted, open-steel grating, welded electro-forged open-steel flooring, and stair treads. *William F. Klemp Co.*

**5 AIR AND HYDRAULIC INFORMATION.** A new booklet describing the application of air and hydraulic power is devoted to showing a number of circuit diagrams indicating how air and hydraulics may be efficiently applied to industrial equipment. *Rivett Lathe & Grinder, Inc.*

**6 FALCON-GREENWOOD VALVES** is a new 12-page, colored catalog featuring every current model of Falcon-Greenwood valve; the vertical swing check, the triple-action safety quick closing, and the combination check-and-plug valve. Complete specifications, prices, and installation recommendations are included. *Falcon Products, Inc.*

**7 MARINE PLATFORMS FOR OFF-SHORE DRILLING.** Booklet describes method of construction of off-shore drilling platform on four caisson-type piers for drilling in waters up to 200-ft. depth. *International Marine Platform Constructors.*

**8 ELECTRIFIED OIL-WELL PUMPING,** a new 47-page illustrated booklet, provides practical help to oil-well operators in improving pumping operations, covers every phase of electrification from motors to power supply, and provides useful information to assist in electrifying any oil lease. *Westinghouse Electric Corp.*

**9 ELLERBEE BROTHERS.** A new, completely illustrated 12-page

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brochure describing the facilities and services of Ellerbee Brothers, structural steel and tank erectors, covers the organization's work in tank erection, industrial piping, structural steel, floating roof, steel building erection, vessels, and miscellaneous refinery construction. *Ellerbee Brothers.*

**10 OVERKOTE** describes a new type of insulation protection material compounded for use as a final weatherproofing and protective coating on insulation used on such equipment as chillers, topping units, storage tanks, ells, valves, and various vessels. *Aber Co., Inc.*

**11 MECCO SAFETY STEEL STAMPS** for all types of industrial marking applications are described in a new four-page bulletin. Included in the bulletin are details on dimensions, character sizes, and prices for various sizes and styles. *M. E. Cunningham Co.*

**12 PROTECTIVE COATING,** an attractive, two-color bulletin on the characteristics, uses, and actual applications of Bitucote protective coating, a general-purpose emulsified asphalt used for protecting a great variety of structures. It illustrates eight actual uses of Bitucote where resistance to acids, fumes, alkalies, salt spray, brine drip, actinic rays of the sun, and the elements is a prime consideration. *Bitucote Products.*

**13 RIG-UP TIME.** This eight-page, illustrated booklet points up the need for good roads in the oil fields and tells how they can be obtained. Complete facts on diesel tractors and motor graders are presented for those in the drilling business. *Caterpillar Tractor Co.*

**14 HOT-PROCESS WATER SOFTENERS.** An introductory section of the bulletin concisely explains the boiler-plant troubles caused by various impurities in water, outlines the 12 different methods of treating water to eliminate these impurities, describes advantages of the hot-process method, and explains the chemistry of hot-process water softening. *Graver Water Conditioning Co.*

**15 FLAMEPROOF UNIT-TYPE METALCLAD DISTRIBUTION GEAR** is an illustrated data sheet on new distribution gear. Information covered includes busbar units, switch units, fuse units, interlocks, cable boxes, offset units, and certification. Capacity of unit is up to 200 amp. at 660 volts, a.c. *Reyrolle & Co., Ltd.*

**16 PRESSED STEEL PRODUCTS.** This two-color, illustrated catalog covers eliptical heads, flanged and dished heads, weld caps, welding sleeves, pressed-steel manways, fabricated weld elbows, fabricated steel plate pipe, and half soles. *Hackney Iron & Steel Co.*

**17 CENTRIFUGAL PUMPS** describes and illustrates a line of refinery pumps especially designed to handle wax, clay-oil, and catalyst slurries, caustics, acids, and sludges. Design of casing minimizes excessive turbulence and eliminates vibration throughout the operation, even if discharge is blocked. Semiopen-type, nonclogging impeller is designed to reduce thrust and pressure on packing. *Mission Manufacturing Co.*

**18 LIQUID STAINLESS STEEL** deals with a new approach to the solution of severe corrosion problems. Liquid stainless steel consists of flakes of stainless steel carried in a vehicle of vinyl plastic. Folder also includes instructions on application, surface preparation, and drying time. *Lockrey-Fater Corp.*

**19 PORTA-DRIVE PIPE-THREADING TOOL** features the advantages of a fully automatic, portable pipe threader that cuts threading time an average of 70 per cent. Threads up to 8 in. pipe. Tool weighs 14 lb. and is small and light enough to fit in tool kit. *Muncie Gear Works, Inc.*

**20 QUADRUPLE-WRAPPED GEOPHONE CABLE** is a fact sheet describing the method of producing geophone cable protected by eight plies of fabric tape. Of particular interest is means of supplying geophone takeouts to customer specification, while cable is being manufactured. *Midwestern Geophysical Laboratory.*

**21 SHAFFER COME-ALONG** lists prices, applications, and advantages of a hand-powered pulling and hoisting tool made in 2,000, 6,000, and 8,000-lb. sizes. *J. E. Shaffer Co.*

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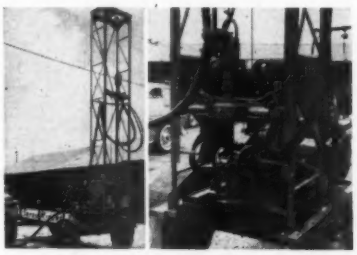
# OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

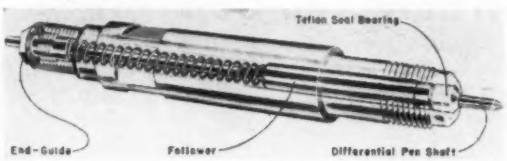
**by Dan B. Miller**

**22 NEW CAREY MIDGET DRILL MODEL H.** The new feather-weight drill is an all-aluminum, all-hydraulic portable drill designed for the marsh lands of the Gulf Coast and muskeg of Canada. Gross weight is 720 lb. which breaks down into three package loads making it adaptable for helicopter transportation. It is complete with engine, mud pump, draw works, cable pulldown, rotary, swivel, and mast. The 10-hp. air-cooled, two-cylinder Onan engine, mud pump, and hydraulic oil pump complete one unit at 272 lb. Draw works, pulldown, and rotary are built into the mast and are carried as a unit that weighs 225 lb. Main base weighs 223 lb. and consists of aluminum H-beams, two double-acting hydraulic control valves, oil reservoir, and cooling system. *Careys Machine Co.*



IT'S NEW CHECK IT

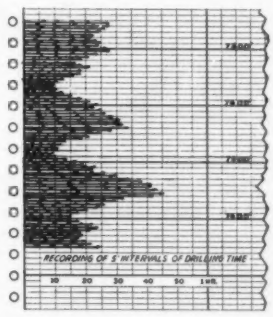
**23 ORIFICE-METER STUFFING BOX** greatly reduces meter maintenance and leakage troubles at the most frequent point of field service, the pen shaft which




transmits the motion of the meter's float, and lies between high-working-pressure zones in the manometer and atmospheric-pressure zones in the chart case. It has been shown leakproof at working pressures as high as 5,000 psi. The heart of the new stuffing box is a combination packing and bearing machined from Teflon. Teflon is tough and chemically resistant to water and all reagents, even sulfuric acid, except molten alkalis. It can take up to 450° F. and flows under pressure very slightly, acting in the manner of a packing material and adjusting itself to the stuffing-box body and to the periphery of the shaft. *Pittsburgh Equitable Meter Division Rockwell Manufacturing Co.*

IT'S NEW CHECK IT

**24 LOG-O-GRAF.** A new drilling-time selector has been added to the Log-O-Graf for the benefit of geologists and engineers that plot 5 and 10-ft. intervals of drilling time on sample logs. A new scale selector has also been added whereby the instrument will now record on 1 in. to 100 ft., in addition to 2 and 5 in. to 100 ft. With scale selector set on 1 in. and time selector set on 5 ft., the instrument will automatically plot a graph that can be correlated directly with sample logs. During the drilling of either 5 or 10-ft. intervals, the stylus momentarily engages the chart at the completion of each foot drilled, and when the selected interval has been drilled the stylus will engage the chart and mark a horizontal line back to its normal zero position. *Warren Automatic Tool Co.*




IT'S NEW CHECK IT

**25 SYNCLINAL FILTER** can be inserted into any pipe carrying noncorrosive liquids. It operates with equal efficiency in any position; up, down or at any angle and has no moving parts. The Synclinal design of the filter insert has incorporated the greatest filtering area within the smallest amount of space. When cleaning is required, by removing one hand nut the entire filter may be disassembled. Adaptability to meet all filtering requirements is furnished by a wide variety of wire mesh ranging from a coarse 30 to a fine 200. Capacity sizes are 5, 8, 10, 20, 30, and 50 g.p.m.

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Greater capacities may be obtained by multiple installations. *Marvel Engineering Co.*

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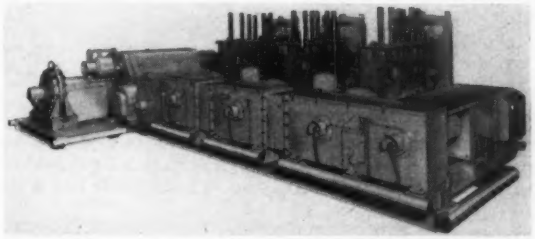
**26 PORTABLE COMBUSTIBLE GAS INDICATOR** for pipe-line inspection is designed to give an alarm immediately when the gas concentration exceeds 20 per cent of the lower explosive limit of combustible gases or vapors in the atmosphere where it is placed. Action is entirely automatic and readings are continuous. The detector head is placed outside the instrument case and makes instantaneous contact with gases present in the atmosphere. When the concentration exceeds 20 per cent of the lower explosive limit, a red signal burns on the control panel simultaneously with the sounding of the alarm. The instrument is also equipped with a detachable probe head and 25 ft. of cord. When the probe head is in use, the detector on the side of the instrument is automatically inactive, the alarm then being activated only by the probe. *Atlas Exploration Co.*

IT'S NEW CHECK IT

**27 FULL-OPENING TYPE-YH CASING HEAD.** Body of head is installed on surface pipe with flange adapter connected to top of head, and with blowout preventer installed for drilling operations. The head is completely full opening, eliminating all problems which arise in connection with restricted bore. Any equipment that will pass into the casing below will go through the head. Single packing ordinarily used for lower pressure ranges, and multiple packing for higher pressure ranges, are available. Where a higher test pressure tree is required above casing head, a sleeve for reducing the pressure packing area is available. Type YH will withstand 4,000 lb. test pressure and is designed for 2,000 lb. cold working pressure. It will suspend maximum total casing weight to 234,000 lb. *Hinderliter Tool Co.*

IT'S NEW CHECK IT

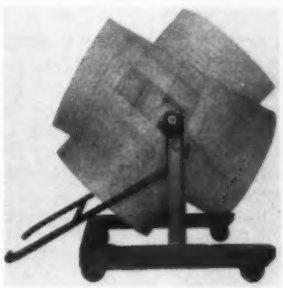
**28 TORCAIR ROADAIR RIG** is designed specifically to be used either with torque converters or direct engine drive. Can be provided as a direct driven rig and converters can be added at any time later, with no changes in rig on drive system. Can be purchased with torque converters, and if desired torque converter can be removed and converted to direct engine drive. Available with chain-driven rotary table, or universal shaft-driven table, or with independent table drive unit. The latter unit available either with or without cathead shaft. Available with engine radiators conventionally mounted in front of engines, or mounted over engines and a bevel gear and V-belt drive to fans to blow air



upwards. This will save about 14 in. in length of engine unit. Can be transported in one unit, or can be broken down into several smaller units where road laws require lesser weights, or lesser widths. *Wilson Manufacturing Co.*

IT'S NEW CHECK IT

**29 HODGSON BARREL CART** is designed to accomplish mixing, moving, pouring, and emptying of 30 and 55-gal. drums. For moving, drum is latched to cart and lifted 7½ in. with handle with a leverage ratio of 8 to 1. Handle can be locked at proper height for safety. By pushing the handle all the way down the cradle is automatically locked in position for rotating the drum end over end for mixing. Over-all width is 32 in. and length is 46 in. Height from floor to bung in pouring position is 15½ in. Weight is approximately 85 lb. Available with either rubber or steel wheel casters and in 55 or 30-gal. drum sizes. *Hodgson Engineering & Manufacturing Co.*



IT'S NEW CHECK IT

**30 CAQUOT PRESSURE STORAGE TANK.** This new tank operates on the principle of a geometrically perfect shape and variable storage pressures dependent upon the quantity of product in the tank. When the standard design tank is being filled, it is automatically maintained at 2½ psig. until the 40 per cent rated capacity level is reached, after which it is automatically maintained at 5 psig. When emptying, it automatically reduces pressure to 2½ psig. at the 40 per cent rated capacity level. Vacuum relief is at 2 oz. All tanks are subjected to tests of 150 per cent of maximum working pressure. All sizes are designed for an excess of 10 per cent of rated capacity for compressed vapor storage. Caquot tanks are available in rated storage capacities

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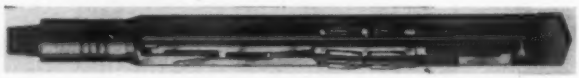
from 7,000 to 180,000 bbl. and for higher working pressures. *Marine Service Co.*

IT'S NEW CHECK IT

**31 GRANT UNDERREAMER** is of the roller cutter type that, although especially designed to cut into hard and abrasive formations normally requiring rock bits, also performs with efficiency in soft strata. It has a posi-



tive expanding action and a cutting capacity that assure full-gage hole, and fast safe landing of the casing string. Expansion of the cutters allows the retention of a sheath of cement around the casing shoe, sufficiently thick to insure an effective water shutoff. It does not need to be taken out of the hole in order to reset the cutter assemblies. *Grant Oil Tool Co.*

IT'S NEW CHECK IT

**32 CRESCENT FOUR-WAY SOLENOID VALVE** is available for control of air, water, and light oil up to 150 psi., in pipe sizes of ¼, ⅜, ½, and ¾ i.p.s. It is designed to withstand continuous opération of up to 600 cycles a minute. Records show performance of several million cycles without maintenance. *Barksdale Valves.*

IT'S NEW CHECK IT

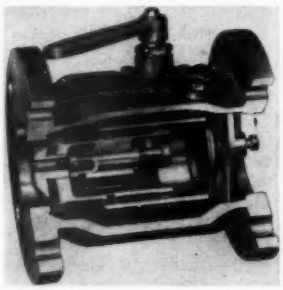
**33 AEROLUBER,** a centralized lubrication system that will bring modern greasing convenience to drilling rigs. Can be assembled for any type installation and is designed for effective use at any point where there is a concentration of machinery. Typical installation for a rotary rig includes two spring loaded reels, each with 50 ft. of Aeroquip hose, hose fittings, grease fittings, and grease control valve with pressure controls to eliminate danger of bursting bearing seals. It incorporates an Alemite Atomic lubricant pump flanged to a drum head that fits any standard 100-lb. grease drum. In operation the drum head is fastened to the container and is not removed until it has been completely emptied. Any air source affording 80 to 150 lb. pressure can operate this equipment. *Aeroquip Sales & Engineering, Inc.*

IT'S NEW CHECK IT

**34 ANTI-SEIZE COMPOUND RB-1,** a high-temperature thread lubricant has been field and laboratory tested to withstand temperatures in excess of 1,200° F. and pressures up to 25,000 psi. It will prevent leakage in casing and macaroni string tubing and also allow for the easy disassembling of the joints for redrilling. The product also guards against galling of drill collars, subs, and tool bits. *Wingo Products Co.*

IT'S NEW CHECK IT

**35 GRANCO LOADING STEM VALVE.** The new valve incorporates slow-closing, hydraulically balanced features which eliminate valve slamming, line shock, and difficult opening due to line pressure. No more effort is required to operate it at maximum pressure than at minimum. Closing speed is easily adjustable over a wide range by a readily accessible adjustment screw on the outside of the valve. Adjustment can be made without draining lines or product spillage. Positive sealing action is accomplished by use of a heavy-duty thiokol valve face which can be easily reversed, doubling its normal life. These valves are stocked in 2, 2½, 3, and 4-in. sizes with standard 125-lb. flanges. *Granberg Corp.*



IT'S NEW CHECK IT

**36 MILLER BALL-BEARING SWIVELS.** A strengthened and more complete line of swivels for wire-line twist and kinking consists of 15 different types of end connections and 9 swivel capacities ranging from the "AA" model rated at 250-lb. working load to the "H"

model at 46,200-lb. working load. All models have a safety factor of 5 to 1. Swivels turn freely under maximum stress, removing all the kink and twist usually present when a wire line is heavily loaded, eliminating spinning of the load. *General Machine & Welding Works.*

IT'S NEW CHECK IT

**37 ROUGH TERRAIN COMPRESSOR.** A special pipeline model, portable air compressor with a standard engine and compressor unit mounted on pneumatic tires, is designed to operate in rough terrain and on unusually steep inclines. It is built to give continuous performance under the unfavorable dusty conditions encountered in pipe-line construction. The unit is equipped with a special oil-bath air cleaner, a steep-angle oil sump, and a readily accessible heavy-duty replaceable cartridge oil filter. *Worthington Pump & Machinery Corp.*

IT'S NEW CHECK IT

# PIPE LINES

## Capacity Increase

### Tuscarora to rebuild 360-mile system

NEW YORK.—Esso Standard Oil Co. will treble capacity of its 360-mile products pipe-line system between Linden, N. J., and the Pittsburgh area, under a reconstruction and expansion program announced last week.

The line is owned by Esso's affiliate, Tuscarora Oil Co. Present capacity of the system is 25,000 bbl. daily of gasoline and distillate fuels. It will be raised to 45,000 bbl. initially, with a potential capacity of 80,000 bbl., the company said.

Present pipe of varying size is being replaced with 10 and 12-in. pipe, and 9 pumping stations now in operation will be replaced by 4 larger new ones.

The line begins at Esso's Bayway refinery, and serves the Pennsylvania area through five terminals near Reading, Altoona, Johnstown, Harrisburg, and Pittsburgh, all in Pennsylvania, and West Virginia at the western terminal with barge-loading facilities for service to cities along the Ohio River.

The system was originally laid in 1908 for transportation of crude. Converted into a products line in 1930, it was returned to crude service for military requirements during World War II.

Although it has been modernized several times previously, this is the first complete replacement of the entire line, John de Groot, president of Tuscarora, said.

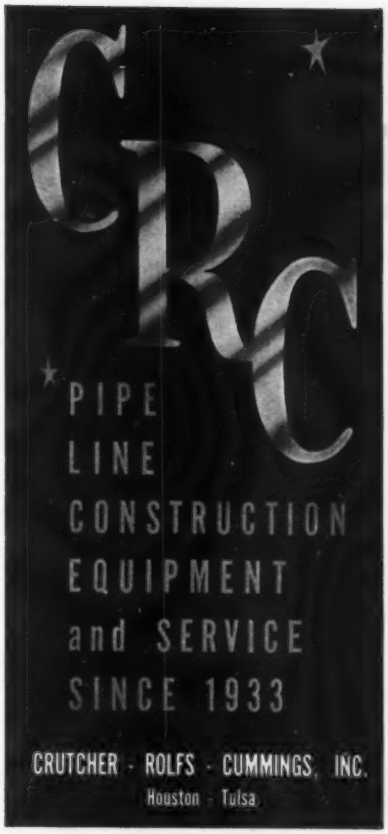
## Southern California Line

LOS ANGELES.—The first 31-mile section of Southern California Gas Co.'s new Texas loop line has been completed and is in operation. Completion of this section of the 82-mile, $5,000,000 natural-gas transmission line will give an early increase in delivery capacity prior to final completion of the entire project, the firm reported.

The line is designed to increase daily gas deliveries from the Mid-Continent area to southern California by 100,000,000 cu. ft. Starting from a point on the present Texas-to-California line at the Whitewater River, the first section parallels the present line. Midwestern Constructors, Inc., Tulsa, is in charge of construction on the line, together with Johnson Western Gunite Co., San Pedro, Calif., and L. E. Dixon Co., San Gabriel, Calif.

Crews were reported welding and lining up pipe 7 miles farther west, close to March Field, Calif., and a second crew is working in the city of Riverside, Calif. This section, 4 miles long, is being handled with a minimum of men and equipment. Right-of-way on the balance of the line is graded, and ditching operations are several miles ahead of the main spread.

*ON T. G. T. LINE.—H. C. Price Co., construction crew is shown preparing to lower a 600-ft. section of Tennessee Gas Transmission Co.'s new natural-gas line to Buffalo, N. Y., into a ditch in Ohio. Because of corrosive qualities of eastern Ohio soil, the entire line across that state is being coated and wrapped.*

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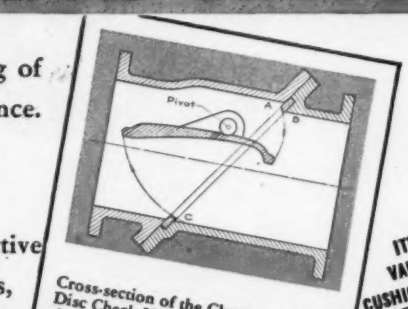
# HOW MUCH DOES SLAMMING COST YOU EACH YEAR?

## CHAPMAN TILTING DISC CHECK VALVES

Take just a moment to figure how much the slamming of ordinary check valves is costing you in extra maintenance. You'll find it's *plenty!*

Then switch to Chapman Tilting Disc Check Valves. You'll eliminate the slamming that causes those destructive pipe line stresses. Most of the wear on seats and hinges, too. And head losses will be almost 80% lower than for conventional type check valves.

Those features mean important savings. Yet there are many more. Write today for additional information.




Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

IT'S THE VALVE WITH CUSHIONED CLOSING!

**The Chapman Valve Mfg. Co.** INDIAN ORCHARD, MASSACHUSETTS

The 30-in. pipe is now being strung west from the Santa Ana River into the Chino Valley, and the line is expected to be finished and in full operation by October 1.

## Expansion Is Authorized

WASHINGTON.—Temporary authorization for the construction of facilities which will nearly double the present annual sales capacity of Michigan-Wisconsin Pipe Line Co.'s existing Texas-to-Michigan natural-gas pipe line, has been granted by Federal Power Commission.

The authorization specified, however, that with the exception of two compressor stations which have been substantially completed pursuant to a prior temporary authorization, the facilities shall not be operated until so ordered by FPC.

The firm will install 139,200 hp. of additional compressor capacity on the line, which now has an authorized capacity of 29,600 hp. Estimated cost of the project is $22,732,000.

The construction program involves both Michigan-Wisconsin and Michigan Consolidated Gas Co., and will increase annual sales capacity of the former firm's big line from 56,575,000,000 to 110,595,000,000 cu. ft.

Michigan Consolidated will install facilities to provide additional storage capacity in connection with Michigan-Wisconsin's plan. Cost will be $15,346,500 for the over-all facilities.

## Stations Put in Service

TULSA.—Service Pipe Line Co. (formerly Stanolind) will put pumping stations at El Reno, Okla., and Childress, Tex., back in service, due to increased production allowables for West Texas oil fields, J. R. Polston, general manager, announced here last week.

The Texas Railroad Commission increased allowables for July by 66,706 bbl. daily and all fields except East Texas fields will be permitted to increase from 19 to 21 producing days.

Service's pumping stations at El Reno and Childress had been on a standby basis since September 1, 1949, when they were shut down due to reduction in transportation requirements.

The stations are on the company's Slaughter, Tex.-Drumright, Okla., 16-in. line, through which crude is pumped from New Mexico and West Texas fields, including new production from Kent and Scurry counties, Texas.

A 36-mile, 8-in. extension to the system from Post to southern Kent County was completed in April.

The company also announced that Kansas division headquarters of the company, have been moved from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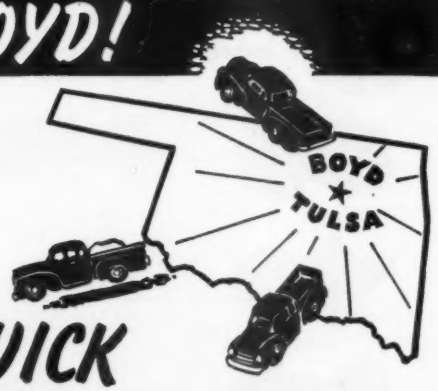


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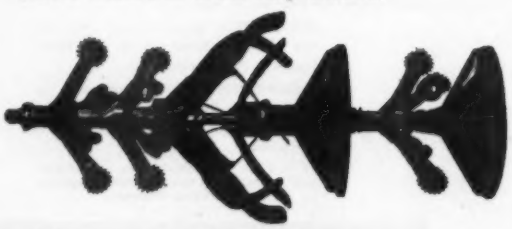

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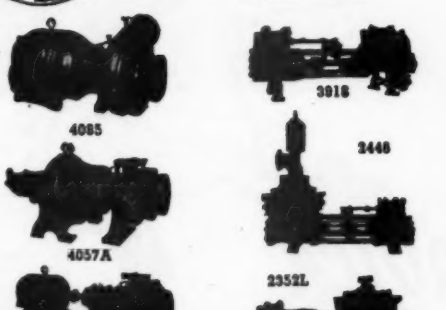


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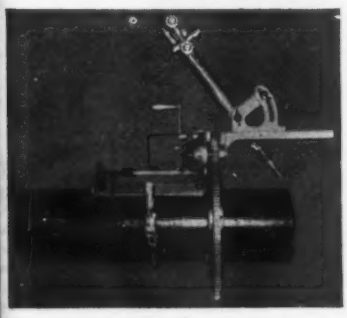

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**SPEED:** Complete cut and bevel can be made on 12 inch pipe in about 2 minutes.
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**The H & M**
**Pipe Beveling Machine Co.**
311 East Third Street, Tulsa, Oklahoma

Humboldt to Wichita, because of the city's central location.

## Sunray Buys Lines

TULSA.—Sunray Oil Corp. has purchased two auxiliary pipe-line gathering systems in South-Central Oklahoma.

A total of 15 miles of 2 to 4-in. lines, located in the Cruce, Northwest Cruce, Doyle, Southeast Doyle, West Doyle, and Gann pools of Stephens County were bought from Interstate Oil Pipe Line Co.

The new gathering system, currently handling approximately 800 bbl. of high-gravity sweet crude daily, has been connected into Sunray's present crude-oil pipe-line system located east of Duncan, Okla., where the company's high-octane gasoline refinery is located.

The second line was purchased from Service Pipe Line Co. (formerly Stanolind) and consists of approximately 30 miles of 2-in. to 6-in. pipe for delivery of approximately 600 bbl. per day of crude oil through the company's system serving its Allen refinery.

This gathering system is in Seminole and Hughes counties, and serves the Allen, Hawkins, Sasakwa townsites, East Sasakwa, and Wofford pools.

Sunray is now buying about 15,000 bbl. of crude daily through its own pipe-line gathering system.

# Volume Up

### Flow of refined products in line gains 13 per cent

WASHINGTON.—Gains in the volume of the three principal refined petroleum products handled in pipe lines in the United States during the first 4 months of 1950 ranged up to 13 per cent above the same period in 1949.

Products delivered from lines totaled 120,918,000 bbl., an increase of 13.2 per cent, or 14,143,000 bbl. over the same period in 1949.

Products turned into lines totaled 121,392,000 bbl., up 12,885,000 bbl., for a gain of 11.8 per cent over the same period last year.

In April, deliveries of products from lines totaled 30,993,000 bbl., which is a gain of 12.7 per cent, or 3,501,000 bbl. over April 1949. Products turned into lines totaled 30,791,000 bbl., 10.7 per cent, or 2,989,000 bbl. more than in April last year.

Of the total deliveries in the first 4 months of this year, motor fuel accounted for 73 per cent. Distillate fuel oil accounted for 20 per cent, and kerosine, 7 per cent. The ratios at this time last year were: 75 per cent motor fuel; 18 per cent distillates; 8 per cent kerosine.

**Internal Lineup**

Crose Internal Lineup Clamps are available in manual, electric and hydraulic models for pipe sizes ranging from 12" to 36". Crose Internal Lineup Clamps have been proven in world-wide field operations.

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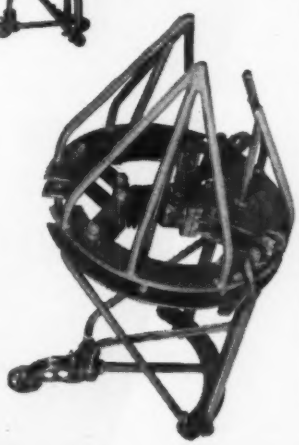

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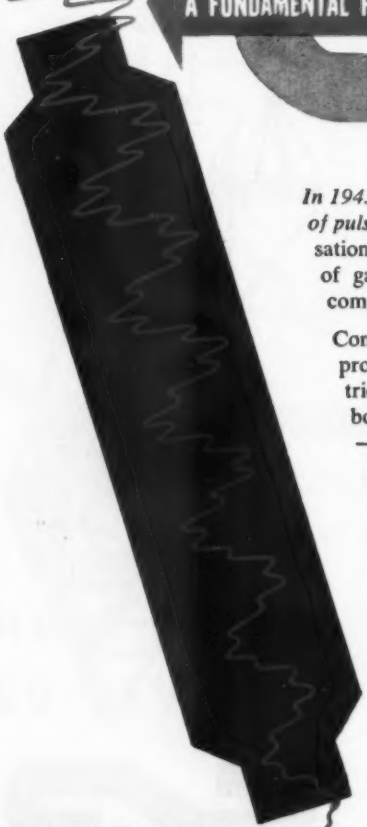

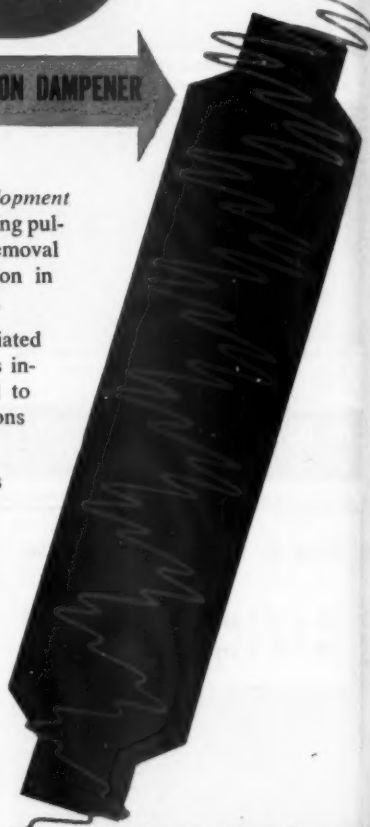

*In 1943, The Fluor Corporation pioneered the development of pulsation dampeners.* The first U. S. Patent covering pulsation dampeners designed specifically for the removal of gas stream pulsation and subsequent vibration in compressor piping was issued to Fluor in 1946.

Continued research in gas pulsation and its associated problems has established that pulsation, and its intricate secondary vibration, can be attributed to both fundamental and high frequency pulsations *—or to high frequency components alone.*

Whichever of these destructive conditions exists in your plant, Fluor offers a dampener engineered to fit the requirements of the specific problem. Fluor—and only Fluor—offers such a complete range of pulsation dampeners. For this reason you can be assured of an unbiased recommendation on the best type dampener for your *particular* requirements.

### THE FLUOR FUNDAMENTAL PULSATION DAMPENER

This type dampener smooths out all pulsations in the gas stream to the extent of at least 85%. All harmonics originally set up in each pulse cycle are automatically reduced or eliminated. This dampener is the guaranteed answer in plants where structural vibration and metering difficulties are encountered—irrespective of pulsation frequency.

### MAKE YOUR OWN PRELIMINARY SURVEY

In many cases you can make your own preliminary survey to determine roughly if your pipe vibration is caused by pulsations. Write The Fluor Corporation, Ltd., Los Angeles 22, California, indicating layout of compressor house piping and operating pressures. A procedure will be mailed to you promptly. No obligation.

### THE FLUOR HIGHER FREQUENCY PULSATION DAMPENER

This dampener removes objectionable pulsation frequencies encountered above the fundamental. In many instances, it has been found that metering difficulties and vibration of compressor piping and nearby vessels have been caused by the higher frequency components alone. Available in both manifold and in-line types, this dampener is competitive in cost with muffler or snubber type devices.

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# REFINING

## Catalyst Firms Expand

NEW YORK.—Two leading catalyst manufacturers have announced expansion and production to meet increasing demand from the petroleum-refining industry. Plans concern a new catalyst plant and a new improved fluid catalyst product.

American Cyanamid Co. will shortly begin construction of a $3,000,000 plant in East Chicago, Ind., which will increase the company's production of synthetic catalyst by 50 per cent. It is expected to be in operation by mid-1951. The new American Cyanamid plant will supplement production from the company's sole catalyst plant at Fort Worth. Addition to fluid catalytic cracking capacities in the Midwest and East prompted the company to locate facilities for microsphere catalyst in the Chicago area.

The Davison Chemical Corp. will complete a modernization program of the Cincinnati synthetic catalyst plant, in October. Investing more than $1,250,000 in new facilities including improved spray-process equipment, the company states that the new fluid catalyst product will show truer sphericity and more uniform particle size distribution than former types.

## New Carbon Black Developed

BARTLESVILLE, Okla.—Phillips Petroleum Co., which last week announced development of a new synthetic rubber made without use of styrene *(The Oil and Gas Journal, June 29, 1950, page 108)* has announced a new carbon black, made from oil.

The carbon black, called SAF black, is produced by a continuous process in equipment suitable for large-scale commercial plant operation, and samples are being distributed to the rubber industry for evaluation in laboratories and on the highways.

The carbon black promises to give increased wear resistance to rubber, and add more miles to tire life than obtainable from any available carbon black, K. S. Adams, Phillips president, said.

When used with "cold" rubber, the new carbon black is expected to produce tire treads having 25 to 50 per cent better wear resistance than similar treads compounded with best commercially available carbon black, he said.

## Texaco Signs Contract

NEW YORK.—The Texas Co. has signed a contract with Local 539, Oil Workers International Union (C.I.O.), covering all employes of the firm at Long Island City, Brooklyn, Glenwood Landing, Ossining, and New Rochelle, N. Y., bulk plants, and the company's Long Island City repair shop, except agents, assistant agents, and repair-shop foreman, P. L. Morell, New York sales division, announced last week.

The contract is effective as of June 1 and runs for 1 year.

Execution of the contract brings employes involved the increased bene-

### NELSON REFINERY-CONSTRUCTION INDEX

**Appears in the first issue of each month.**
**Explanation—Cost-imating No. 61, December 15, 1949, pages 91, 92.**
**Compiled by W. L. Nelson—Refinery Consultant—Tulsa.**
**Indexes of Individual Equipment Items—January, April, July, and October.**

| INDEX (1946 = 100) | 1947 | 1988 | 1949 | Mar. 1950 |
|---|---|---|---|---|
| Centrifugal pumps | 109.0 | 120.0 | 118.9 | 123.7 |
| Reciprocating pumps | 128.5 | 138.1 | 144.6 | 139.6 |
| Compressor | 114 | 128.0 | 120.0 | 117.0 |
| Engines | 109 | 120.0 | 115.5 | 113.2 |
| Motors | 110 | 112.7 | 114.0 | 129.0 |
| Transformers | 116 | 116.0 | 116.0 | 116.0 |
| Instruments | 113 | 120.0 | 122.0 | 123.1 |
| Miscellaneous equipment average | 114.2 | 122.1 | 121.6 | 123.1 |
| Materials component | 122.4 | 139.3* | 143.6 | 145.7 |
| Labor component | 113.5 | 128.0 | 137.1 | 140.5 |
| Refinery construction index | 117.0 | 132.5 | 139.7* | 142.6 |

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Single and double-check and combination lubricant screw fittings for any lubricated plug valve.

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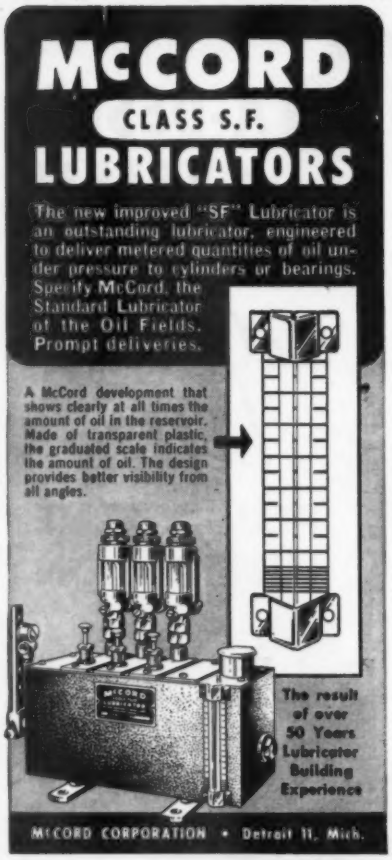
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fits of life insurance, hospitalization, and pension plans, which the company put into effect July 1 for all employes participating in the plans, but not represented by unions, or, if represented by unions, after agreements are reached with bargaining agencies, Morell said. Texaco will bear the entire cost of the additional benefits.

Elsewhere in the Texaco strike situation, return of additional workers recently raised output at the firm's Lockport, Ill., refinery to between 80 and 85 per cent of normal, T. A. Mangelsdorf, plant superintendent, reported. He said that slightly more than 70 per cent of the refinery's personnel had returned to work.

The plant at Casper, Wyo., struck for the third time this year, is operating on a limited basis, and some workers have returned to the company's Port Arthur, Tex., plant, where limited operations are under way.

## I.R.A.A. Counsel Named

HOUSTON.—Norman L. Meyers has been named national counsel for the Independent Refiners Association of America.

A graduate of Yale University law school and Brookings Institution, Meyers formerly was a member and executive secretary of the Petroleum Administrative Board, and was the first chairman of the Federal Tender Board. He was also counsel for the Petroleum Refining Industry Advisory Committee for the Office of Price Administration.

## Socony Renews Fellowship

NEW YORK.—Socony-Vacuum Oil Co., Inc., has awarded $2,000 to Yale University, New Haven, Conn., for renewal of a fellowship in organic chemistry during the academic year September 1, 1950-July 1, 1951.

A total of 20 fellowships will be supported by the company during that year at colleges and universities in the United States, at a cost of $40,000. They represent 19 renewals and one new fellowship.

## Research Unit Completed

TEXAS CITY, Tex.—Construction of a new research building here for Pan American Refining Corp. has been completed.

The one-story structure will provide an additional 10,000 sq. ft. of floor space for research uses at the company's Texas City refinery. H. K. Ferguson Co. constructed the building.

## Husky Refining, Oil Merged

CODY, Wyo.—Husky Refining Co. has been merged with Husky Oil Co., a Delaware corporation, the latter firm announced here last week.

Stock ownership and management in Husky Oil will remain the same as that of Husky Refining Co.

## Win Safety Trophy

EAST CHICAGO, Ind.—Employes of Socony-Vacuum Oil Co., Inc.'s refinery here—some 420 in all—completed 593 working days recently without a disabling injury, thus winning a safety trophy.

The trophy was presented at a safety rally by J. L. Risinger, safety supervisor for the company. W. W. Reed, plant manager, and J. L. DuFon, safety director of the refinery, accepted the award in behalf of employes.


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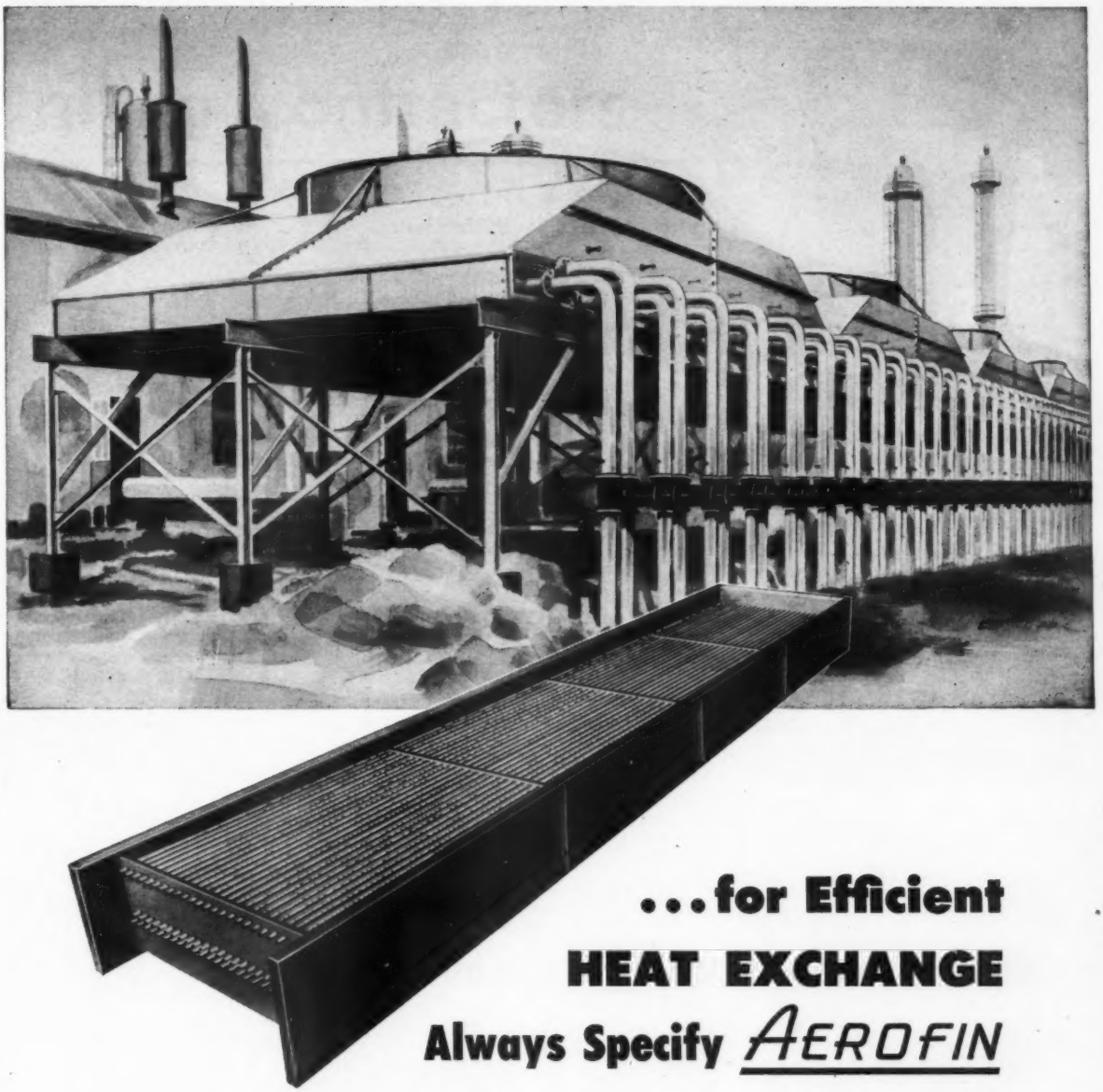

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Whatever the heat-transfer problem — whatever the medium — whatever materials are required for highest efficiency and lowest maintenance costs, you can always rely on Aerofin.

Unequalled experience and production facilities, plus constant research and materials testing, assure the proper construction and design for greatest efficiency and longest service life. ***Ask the Aerofin man.***

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YOU ARE CORDIALLY INVITED TO ATTEND THE FIRST SHOWING OF THE BREWSTER N-12 DRAWWORKS - FOR DRILLING 12,000 FEET PLUS BREWSTER PLANT, SHREVEPORT, LOUISIANA - JULY 18 THRU 22.=

HARRY B. MARIONEAUX
GENERAL MANAGER, BREWSTER COMPANY=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

# Among the Drilling Contractors

## Drilling Activity Mounts To 1½-Year Record Level

Drilling activity in the United States and western Canada continued to mount during the week ended June 26 (latest report), boosting the number of rotary rigs operating in these regions to 2,312. This was the greatest number since December 20, 1948, when 2,423 rigs were running. The total represented an increase of 28 rigs over the number reported the previous week.

In the United States alone, 2,284 rigs were reported running June 26. This also was the greatest number since December 20, 1948, and an increase of 31 over the previous week. Particularly notable was an increase of 16 rigs in Oklahoma, raising the total to 313, the greatest number ever recorded in this state. Not since November 1948 has the number of active rigs in this state been above 300.

Active rigs by areas are shown in the following tabulation:

**ROTARY RIGS IN OPERATION***

(United States and Western Canada)

| Area— | Week ended 6-26-50 | Change week ended 6-19-50 | Change week ended 6-27-49 |
|---|---|---|---|
| Gulf Coast | 511 | +12 | —35 |
| West Texas-N. M. | 744 | +2 | +232 |
| Ark.-N. La-E. Tex. | 150 | +1 | —18 |
| Oklahoma | 313 | +16 | +79 |
| Kansas | 134 | —5 | +2 |
| Illinois-Eastern | 151 | +11 | +33 |
| Rocky Mountains | 98 | —3 | —19 |
| Pacific Coast | 129 | —3 | —50 |
| Total United States | 2,230 | +31 | +224 |
| Western Canada | 82 | —3 | +11 |
| Total | 2,312 | +28 | +235 |

*Courtesy Hughes Tool Co. Trends in drilling activity for the United States and the Rocky Mountain and western Canada areas are shown by graphs on pages 110 and 111.

**A. W. Eggleston,** Crowley, La., has the contract for another well to be drilled for Caddo Oil Co. and A. O. Petersen in the Abbeville field, Vermilion Parish, Louisiana. The well will be 2 Erastus Faulk, located in 66-12s-3e. Projected depth is 6,500 ft.

**T. P. Pike Drilling Co.,** Los Angeles, Calif., has a contract from Potomac Oil Co. to drill 3-1 Sprague, a wildcat test in 21-3n-23w, Ventura Avenue area, Ventura County, California.

**Olson Drilling Co.,** Tulsa, has been awarded the contract and is moving in rig for a 7,000-ft. wildcat test to be drilled for Cities Service Oil Co. in eastern Greer County, Oklahoma, near the Harmon County line. Location is on the Kerbo lease in 15-4n-24w.

*On the rig floor where Stovall Drilling Co., Inc., of Monroe, La., and Satanta, Kans., is drilling under contract for Columbian Fuel Corp., Ulysses, Kans., in Grant County, in the Hugoton gas field, southwestern Kansas. Left to right: Roy Lowry, floorman; R. G. Brown, driller; Robert Grady, superintendent, Columbian Fuel Corp.; Buck Clark, floorman; Jack McClure, derrickman; B. L. Miller, landowner where the rig is located; W. E. Reed, drilling superintendent, Stovall Drilling Co.*

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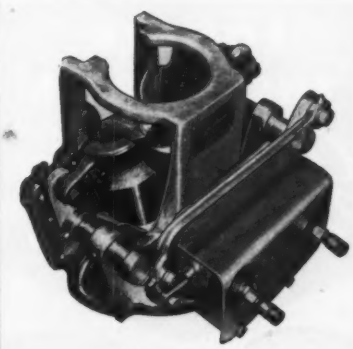

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**Moutray-Rankin Drilling Co.,** Davis, Okla., is starting a wildcat test for Vickers Petroleum Co. at 1 Ellzery, in 3-2s-7w, northeast of Marlow, northern Stephens County, Oklahoma.

**Petersen Drilling Co.,** New Orleans, is undertaking a wildcat drilling venture of its own with location made for a Wilcox sand test 5 miles southwest of the Possum Corner field, Wilkinson County, Mississippi. The objective is expected around 7,750 ft. Location is in 2-3n-3w.

**Art Logan Drilling Co.,** Wewoka, Okla., is the contractor on a 5,000-ft. wildcat test being drilled by O. N. Sellers in western Leflore County, eastern Oklahoma. Location of the test, 1 Long, is in 25-3n-22e, 4 miles east of Talihina.

**Glasscock Drilling Co.,** Shreveport, is the contractor and joint operator with Midstates Oil Corp. on a Wilcox test, 1 Deville, being drilled in the Big Island field, Rapides Parish, southern Louisiana.

**Tiger Drilling Co.,** Oklahoma City, has moved a rig to a location 1½ miles from the southeast tip of the Happy Valley pool in northeastern Lincoln County, Oklahoma, where it will drill 1 Cook, 6-16n-6e, for Aurora Gasoline Co.

**Rocky Mountain Drilling Co.,** Los Angeles, has contracts for drilling two offsets to the recently completed 6,400-ft. extension producer southeast of the Long Beach field, California. One will be for Harley & Kelley; the other for R. W. Jerman and Frank Bartee.

**Big Chief Drilling Co.,** Oklahoma City, has a contract from Gulf Oil Corp. for another deep test to be drilled in the Northeast Bradley area, Grady County, Oklahoma. It will be 1 Mainka-Ring Unit, 12-5n-5w.

**Colorado-Wyoming Drilling Co.** is the contractor on a wildcat test which Ed Fisher is drilling on patented land in 23-2n-68w, 22 miles north of Denver, southwestern Weld County, Colorado.

**Sterling Drilling Co.,** Sterling, Kans., has a rig running for J. J. Lynn on a wildcat test 1¼ miles east of the Hoisington pool, Barton County, Kansas. Location of the test, 1 Munns, is in 23-17-13.

**Earl Wakefield,** Wichita, has started a second well for Stanolind Oil & Gas Co. and associates for the recently discovered pool near Bushong, Lyons County, northeastern Kansas. The new well, 1 Polk, NE SE SE 23-16-10e, is two locations north of the discovery well, completed as a small Hunton lime producer. It will be drilled to the Arbuckle.

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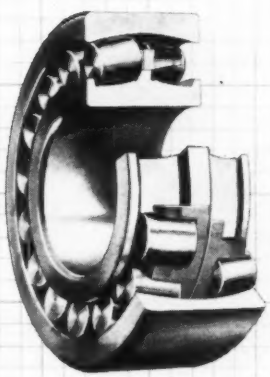

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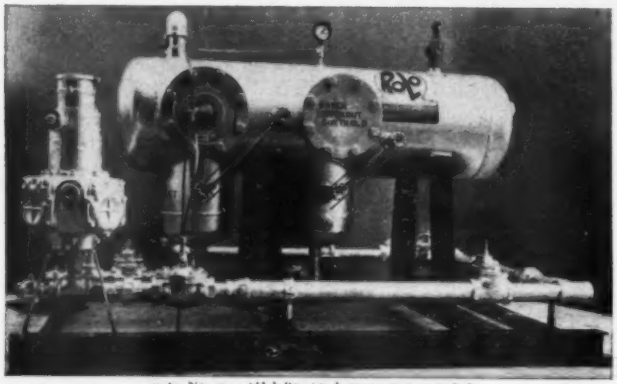

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# NATURAL GAS

## Shell Gas for Calgary

CALGARY, Alta.—An agreement has been completed between Shell Oil Co. and Canadian Western Natural Gas Co., supplier of gas for this city, whereby Shell will supply the Calgary firm with up to 20,000,000 cu. ft. of gas daily over the next 10 years at a price of 10¾ cents per 1,000 cu. ft.

The Calgary company will thus be connected with about one trillion cubic feet of gas reserves, which at the present rate of consumption, will last 40 years or more. The gas supply from Shell will be connected with the city before the end of this year, and will be available in January.

Shell will begin immediately installing a gas-gathering system capable of delivering up to 50,000,000 cu. ft. of gas daily. Canadian Western will build a 12-in. transmission line to the Jumping Pound field, with capacity up to 100,000,000 cu. ft. daily.

The Jumping Pound field, 20 miles west of here, was discovered by Shell in 1944, and has been shut in since, awaiting a market.

## Gas for Indianapolis

WASHINGTON.—Panhandle Eastern Pipe Line Co. has been ordered by the Federal Power Commission to supply 10,000,000 cu. ft. of natural gas daily to the city of Indianapolis.

The company was told to connect its transcontinental transmission facilities with those of Citizens Gas & Coke Co., utility firm of Indianapolis, and was directed to establish a connection in the Zionsville, Ind., area, with facilities to be built by Indianapolis.

Deliveries will begin in October if the city has completed construction of its facilities, FPC said. The order pointed out that on May 4 Panhandle Eastern was authorized to expand its present system from 500,000,000 cu. ft. daily to an ultimate 800,000,000 cu. ft. The firm expects that 50,000,000 cu. ft. of additional gas will be available during the 1950-51 winter heating season.

## Cities Service Expansion

WASHINGTON.—Cities Service Gas Co. has asked the Federal Power Commission for authorization to add three 1,000-hp. gas-engine-driven compressor units at its North Welda, Kans., station which would increase the amount of natural gas to be withdrawn by 35,000,000 cu. ft. daily.

The program, to cost about $885,000, provides for a new station in Johnson County Kansas, consisting of three 230-hp. gas-engine-driven compressor units, to be used to withdraw gas from the Craig storage field for delivery into the firm's main gas line. The company would abandon its South Welda station, and compressors from this station would be installed in Johnson County.

## New Building Planned

OMAHA.—Northern Natural Gas Co. will construct a new main office building here as a part of its 1950 expansion program.

The building, to be 6 stories in height, will be started in July, and completion is expected by October 1951. The company's large increase in personnel has made it necessary to move into more suitable quarters, the company said.

# Natural Gasoline

## Plant Dedicated

### North Cowden facilities now in full operation

ODESSA, Tex.—The North Cowden gasoline plant 15 miles northwest of here—an integral part of one of the largest gas-injection projects ever developed—was formally opened last week in dedication ceremonies held at the plant site.

Designed and built to help conserve Texas' natural-gas resources, the installation is owned by 21 companies and individuals.

The project, first announced in 1948, serves the dual purpose of increasing the ultimate recovery of crude oil from the North Cowden reservoir, and increasing recovery of liquid products from the gas.

A cooperative effort of 32 oil operators owning about 80 per cent of the field, the North Cowden injection program is a 20-year project. Injection of gas into the Grayburg producing formation was begun early last month. When the initial phase of the program is completed, each of the 33 unit blocks, comprising a total of 20,500 acres in Ector and Andrews counties, will have an injection well in operation. Eventually there will be a minimum of two injection wells on each unit block.

Built by Stearns-Roger Manufacturing Co., Denver, the North Cowden plant has a design capacity of 50 million cubic feet; however, this can be doubled by installing additional equipment. With this in mind, most of the process area is designed with an eventual capacity of 100 million cubic feet per day. Operating at its present capacity, the plant can recover 150,000 gal. of liquid products daily. This includes 35,000 gal. of propane, 23,000 gal. of butane, and 93,000 gal. of 26-lb. R.v.p. natural gasoline.

The plant is situated near the center of the North Cowden field in Ector County. The field covers some 27,000 acres in Ector and Andrews counties and has some 680 producing wells on a 40-acre spacing pattern. Discovered in 1930, the field had produced a cumulative total of about 79 million barrels of crude oil by the end of 1949.

The 21 participating owners of the plant are: Stanolind Oil & Gas Co., The Texas Co., Cities Service Oil Co., Sinclair Oil & Gas Co., Sun Oil Co., Atlantic Refining Co., Tide Water Associated Oil Co., Continental Oil Co., Aline C. Delaney, Mid-Continent Petroleum Corp., Amerada Petroleum Corp., D. E. Kervin, William E. McBee, Ohio Oil Co., Kiska Oil Co., Texas Gulf Producing Co., Edward E. Reigle (trustee), Acme Oil & Royalty Co., Iva C. Richmond, Ocie Virginia McDonald, and Janice Florine Whitted.

The plant will be operated by Stanolind. Officials include E. R. Wagner, plant superintendent; H. B. Langford, Jr., assistant superintendent; M. D. Straube, plant engineer; and S. G. Baker, plant clerk.

## Production Is Up

WASHINGTON.—Production of natural gasoline and allied products increased 14.1 per cent in the first quarter of this year over the same quarter in 1949, the U. S. Bureau of Mines reported recently. Total output was 2,404,518,000 gal., an increase of 297,637,000 gal.

Demand at plants for the products totaled 2,397,628,000 gal. for the period, an increase of 272,160,000 gal., or 12.8 per cent over the same period in 1949.

Liquefied petroleum gas used for fuel amounted to 702,765,000 gal., and increase of 31.2 per cent, or 167,322,000 gal. over the 1949 period.

## N.G.A.A. Meeting Set

TYLER, Tex.—The southern regional meeting of the Natural Gasoline Association of America will be held here October 27 in cooperation with the East Texas Natural Gasoline Men's Club.

Headquarters for the meeting will be the Blackstone Hotel, although technical sessions will be held in the American Legion Building's auditorium.

John P. Tucker, Arkansas Fuel Oil Co., Longview, Tex., president of the East Texas club, and Charles A. Schwartz, Caska Corp., Quitman, Tex., are serving as cochairmen of the program committee.



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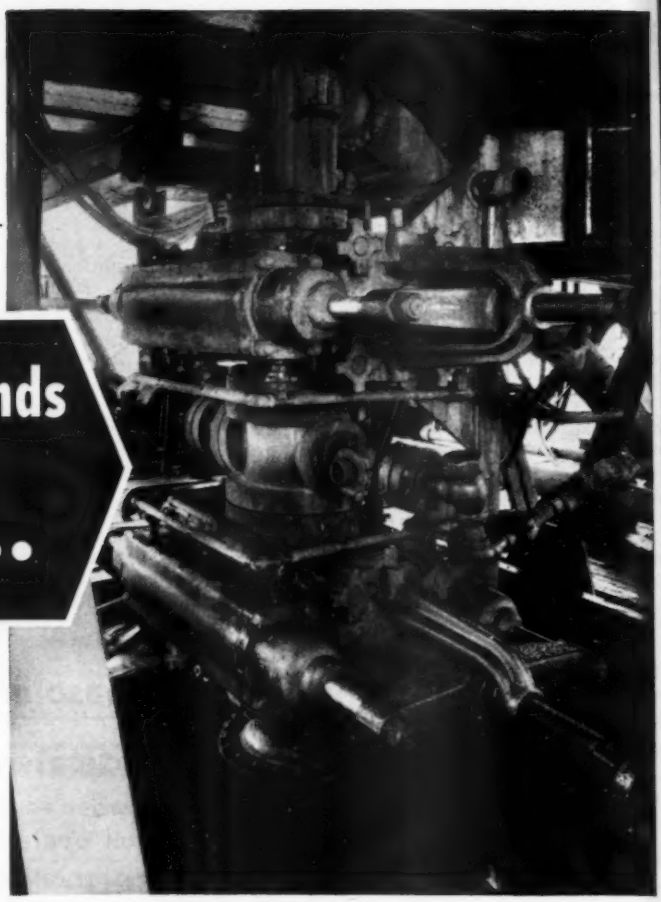

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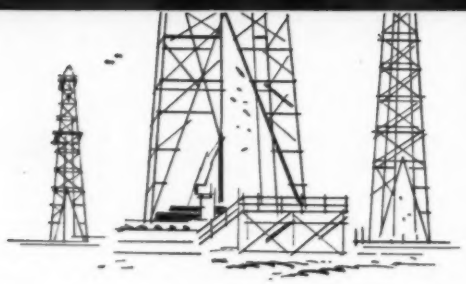

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# Drilling Outlook Good in California

FIELD development drilling in California, which has been on the upgrade in recent weeks, is expected to remain at the higher levels during the third quarter of this year. This trend was indicated by the Conservation Committee's estimate of new completions for the next 3 months.

Since the report was prepared, however, posted prices for heavy crudes were advanced by Standard Oil Co. of California and at the weekend the increase had been met by Union Oil Co. and General Petroleum Corp. The Socal schedule advanced prices for 14°-gravity crude by 15 cents, with the advance tapering off to no increase for 25°-gravity and above. Union and General Petroleum posted similar advances, and it is anticipated that other purchasers of heavy crude will meet the increase.

This improvement in heavy-crude prices, plus the fact that California stocks of heavy crudes and residuals are down one-third from the level of a year ago (to about 20 million bbl.), no doubt will give added impetus to field activity. Likewise, it should act as a mild stimulant to wildcatting despite California's oversupply of heavy crudes.

According to the committee's forecast, Wilmington will remain the state's most active area during the coming quarter. Drilling in that field during June was at the highest level of the year; a total of 17 new producers were completed plus an equal number of recompletions redrilled to remedy damage caused by earthquakes.

Activity in South Cuyama field, San Joaquin Valley region, is expected to result in some 10 wells being drilled monthly — about the same as in the past 2 months. In the new Morales field of north Cuyama Valley, increased drilling is planned. This is particularly true in the Morales-Clayton pool, discovered last April, where five producers have been completed in the 1,850-ft. sand.

This pool and the nearby Morales-Superior pool represent the result of a half-year's wildcatting in Cuyama Valley, during which some 25 tests were drilled. Currently, eight wildcats are drilling, largely in the southeastern end of the valley, and others will begin shortly. Thus it is highly probable that other new valley production will be located in the near future.

Although the Signal Hill area of Long Beach has been producing oil for the past 29 years, in recent weeks two new fault-block pools were discovered. In Signal Hill townsite some 16 wells have been drilled or plugged back to a 2,300-ft. sand opened to production by the J. C. Rogers 1 Enterprise. Some of the later completions have been for modest rates of production, and some with high water cuts, but the shallow depth assures the horizon will be thoroughly tested. Currently about a dozen rigs are at work there.

On the southeast flank of Long Beach, a 6,400-ft. oil sand was opened to production in the middle of June. This discovery, by Jerman and Bartee, was completed for the impressive flow rate of 900 bbl. daily of 29°-gravity crude. Four nearby tests are now under way and locations for two others have been staked.

Last week's head-lining development, completion of a 5,493-ft. producer for an indicated daily flow rate of 3,500 bbl. of medium-gravity crude, will result in increased activity in the Belgian Anticline area. The discovery, drilled by Pacific Western Oil Corp. and Tide Water Associated Oil Co., is either a ½-mile south extension or a new pool opener. Because of the high flow rate it is generally thought that the latter will prove to be the case.

Also affecting Kern County drilling is the good "grass-roots" production being developed at the Tejon Hills pool. This development has been under way for several months, but recently the pace has been stepped up. Southwest of this 500-600-ft. pool, Standard of California last week completed a 150-bbl. pumper, producing from the Santa Margarita at 545 ft. total depth.

## HIGHLIGHTS OF WEEK'S DEVELOPMENTS

**WEST TEXAS.**—Third drill-stem test, to 9,811 ft., was being run at Anderson-Prichard 1 Bevers, south Terry County discovery. Second test, now identified as the Pennsylvanian reef, at 9,697-9,761 ft., flowed 120 bbl. of oil in 4 hours. Earlier reports indicated the well to be a Wolfcamp discovery. (See field reports and news section, this issue.) Amerada 1 Willard, Terry County wildcat 6 miles southeast of the discovery, found Spraberry sand at 7,270 ft., minus 4,035 ft., which was reported some 272 ft. high to the Bevers test. Magnolia Petroleum Co. 2 Roy Parks, Midland County discovery, flowed 650 bbl. of oil in 20 hours through ¼-in. choke from open hole at 12,944-70 ft. Bridwell Oil Co. 1 Julia Farrar Kennemer, 6-16-H&TC, wildcat 2 miles northeast of Carlsbad in Tom Green County, had gas from the Pennsylvanian; a test on perforations at 5,640-65 ft. gaged 1,000,000 cu. ft. daily when gas kicked through the 9-9-lb. mud and flowed out of control.

**ROCKY MOUNTAIN AREA.**—Trigood Oil Co. of Casper has logged shows of oil and recovered oil-cut mud in tests of sands in the Cloverly series at its 1 Couch, northeastern Colorado wildcat. Stanolind Oil & Gas Co. has recemented intermediate casing string at the Ignacio, Colorado, wildcat (1 Ute Indian) after the mud continued to be gas-cut below the Pictured Cliffs. Seaboard Oil Co. tested water in its 63-12-G, Massadona, Colorado, and is coring ahead.

**CANADA.**—Natural gas in volume and crude oil in commercial quantities have been discovered in Lower Cretaceous sands by California-Standard Co. about 9 miles northeast of Stettler pool (Devonian) and 5 miles east of the Cretaceous oil pool opened by Casagama No. 1 last year.



XUM

# South Louisiana

## New Pay Zone Found In Avondale Field

NEW ORLEANS. — New pay has been opened in Avondale field of Jefferson Parish at American Liberty Oil Co. 1 American Liberty fee, irregular 67-13s-22e. Three new pay sands were logged in the well, amounting to a net of 26 ft. of effective pay. New pay series were: 7,749-54, 7,840-63 and 7,949-61 ft. Operator has perforated from 8,180-86 ft. with 36 shots, has run tubing, and is testing the well. Pay sands productive in other wells previously drilled in the area are: 8,156-95, and 7,041-48 ft.

Joe W. Brown has recorded a flow of 224 bbl. in 12 hours through 7/32-in. choke at his 2 South Coast Corp. et al, 100-7s-20e, new pay zone in Valentine field of Lafourche Parish. Production is through perforations at 11,880-84 ft. Tubing pressure was 2,000 psi. and gravity of the oil was 38°. Operator drilled the well to total depth of 12,538 ft. and set 7-in. casing at 11,500 ft. and 5-in. liner at 11,922 ft. This new discovery is located on the northeast side of Valentine field.

Magnolia Petroleum Co. is completing its deep wildcat, 1 Alice B. Rozas, for a new discovery in St. Landry Parish. On drillstem test at 11,412-22 ft., the well flowed 62 bbl. of condensate in 6 hours through a 12/64-in. choke, plus 2,830,000 cu. ft. of gas. Top flowing pressure was 3,573 psi. and bottom-hole flowing pressure was 5,330 psi. This wildcat was drilled to a depth of 14,000 ft. and operators ran previous tests at 12,985-13,003, 13,890-920, and 12,585-601 ft. with no shows. The new discovery is located 2 miles east-northeast of Opelousas in 41-6s-4e.

On the north flank of Weeks Island field, Iberia Parish, Shell Oil Co. is drilling below 14,715 ft. in sidetracked hole at its 2 Weeks Gall State Unit 2, 12-14s-6e. After a prolonged fishing job at total depth of 15,295 ft., crews cleaned up the hole and sidetracked at 14,603 ft. Test has a projected depth of 16,500 ft.

**SOUTH LOUISIANA SUCCESSFUL WILDCAT**

Lafourche Parish: New pay at Valentine—Joe W. Brown 2 South Coast Corp., et al, 100-17s-20e, TD 12,548 ft., top pay 11,880 ft., perf 11,880-84 ft., IP: 224 bbl. oil per day, 38° gravity, 8/64-in. choke, TP 2,000 psi.

**SOUTH LOUISIANA WILDCAT FAILURES**

Calcasieu Parish: Pan American Production Co. 1 B. Ulrich, 18-19s-10w, dry, TD 10,502 ft.

Plaquemines Parish: Barnsdall Oil Co. 4 Breton State Lease 1,343, Block 45, offshore, dry, TD 9,010 ft.

St. James Parish: The Texas Co. 1 Miles Timber Co., 23-13s-17e, Kramer Prospect, dry, TD 12,038 ft.

# Oklahoma

## Harper County Wildcat Finds Oil-Gas Showings

A RANK wildcat, more than 25 miles from nearest production of any kind, in eastern Harper County, northwestern part of the state, has encountered promising oil and gas showings. It is Davon Oil Corp. 1 Harrison-Selman, C NE SE 33-26n-10w, southwest of Salt Springs. Showings were in the Chester lime. A drill-stem test at 6,447-86 ft., taking in an interval at the Morrow-Chester contact, flowed at a rate estimated at 250,000 cu. ft. of gas per day. In the break-down, 25 ft. of gas-cut mud and 150 ft. of oil-cut mud was recovered. Of the latter, 30 ft. at the bottom was heavily cut. Hole is being cored and drilled ahead. It was still in Chester lime at 6,772 ft.

Benson & Montin and E. A. Rumley have run casing to test oil and gas showings in their 1 Pearcy, SW SW SE 30-6n-1e, prospective discovery well located northwest of Rosedale, in Cleveland County. Hole was carried to 6,830 ft. in the second Wilcox sand, topped at 6,815 ft. The latter sand had water but the Bartlesville sand looked promising. Also, the sandy dolomite above the second Wilcox had some prospects. In the latter zone, a drill-stem test with packers at 6,753 and 6,797 ft. yielded 75 ft. of free oil and 75 ft. of oil-cut mud. In a previous drill-stem test of the Bartlesville sand at 5,786-5,805 ft., the well flowed at a rate estimated at 30,000,000 cu. ft. per day and had a spray of distillate.

Deep Rock Oil Corp. 1 DeJarnette, NE NE NE 17-6n-3e, ¾ mile west of the North Rover pool, Pottawatomie County, flowed at the rate of more than 35 bbl. of oil per hour through chokes in testing Viola lime, proving either a new pool, or an extension and new pay zone for the area. Previous production in the North Rover pool has been from the Layton sand around 3,000 ft. The new well, drilled to a total depth of 4,669 ft., topped the Viola at 4,260 ft. Casing was run through the zone to 4,342 ft. and perforated in the upper 10 ft. The well kicked off after swabbing 55 bbl. of oil. It flowed 35 bbl. in the first 40 minutes through ¾-in. choke. Placed on ½-in. choke, it flowed 38 bbl. of oil in the next hour.

Recent discovery of the East Sparks pool, Lincoln County, has been confirmed by completion of a west offset to the initial well. Sinclair Oil & Gas Co. 1 Brooker, SE SW NW 9-13n-5e, the confirmation well, flowed 173 bbl. of 36° oil and 784,000 cu. ft. of gas in 24 hours through ½-in. choke. Prue sand, the pay zone, is open at 3,502-25 ft. The discovery well, J. R. McLean 1 North, SW SE NW 9, is in the sand at 3,508-24 ft.

**OKLAHOMA SUCCESSFUL WILDCATS**

Lincoln County: N. T. Smith 1 Ward, SE SE SW 35-15n-3e, ⅜ mi. N Chandler, elev. 970 ft., flowed 5 bbl. of 26°-gravity oil per day from Prue at 4,098-4,102 ft., TD 4,490 ft., Hogshooter 3,055 ft., Checkerboard 3,390 ft., Oswego 4,015 ft., lime 4,330 ft., Red Fork 4,345 ft.

Major County: Superior Oil Co. of California 1 Fuller (63-30), NE SW NE 30-21n-10w, 4 mi. S Ringwood, elev. 1,179 ft., pumped 32 bbl. of oil per day from Manning at 6,985-7,045 ft., TD 7,307 ft., Herrington 2,405 ft., Florence 2,685 ft., Neva 3,082 ft., Pawhuska 3,890 ft., Tonkawa 4,875 ft., upper Layton 5,355 ft., lower Layton 5,878 ft., Checkerboard 6,265 ft., Oswego-Big lime 6,402 ft., unconformity 6,952 ft., Mississippi lime 7,293 ft.

Superior Oil Co. of California 1 Coppeck "K" (63-9), NE SW NE 9-21n-11w, 3½ mi. SW Ringwood, elev. 1,230 ft., flowed 27 bbl. of oil per day from Manning at 6,905-80 ft., TD 7,225 ft., Herrington 2,462 ft., Florence 2,760 ft., Neva 3,138 ft., Pawhuska 3,825 ft., Tonkawa 4,910 ft., upper Layton 5,453 ft., lower Layton 5,862 ft., Checkerboard 6,183 ft., Oswego-Big lime 6,365 ft., unconformity 6,831 ft., Mississippi lime 7,198 ft.

Marshall County: Miller Bros. et al 1 Otto Hill, SE NE NW 17-6s-6e, flowed 2,440,000 cu. ft. of gas per day from Arbuckle sand at 595-612 ft., TD 613 ft.

Pawnee County: R. S. Shade 1 Colclazier, E/2 NE NW 15-22n-5e, 3 mi. N Pawnee Reservation, elev. 984 ft., flowed 288 bbl. of 44.6°-gravity oil per day from Wilcox at 3,541-44 ft., TD; Avant 2,010 ft., upper Layton 2,193 ft., Hogshooter 2,300 ft., lower Layton 2,345 ft. and 2,400 ft., Checkerboard 2,610 ft., conglomerate 2,665 ft., Woodford 3,515 ft., Misener 3,534 ft., shale 3,539 ft., limy conglomerate 3,540 ft.

**OKLAHOMA WILDCAT FAILURES**

Comanche County: J. D. Harris et al 1 Lynch, SE SW SW 30-4n-11w, dry, TD 209 ft.

Creek County: Mid-Continent Petroleum Corp. 1 Foote, SE NE SE 1-16n-7e, 1¼ mi. W Olean, elev. 949 ft., dry, TD 3,733 ft., Bruner 948 ft., Hogshooter 1,421 ft., Layton 1,480 ft., Checkerboard 1,768 ft., conglomerate 1,773 ft., Oswego 2,422 ft., Wheeler 2,464 ft., Prue 2,511 ft., Verdigris 2,570 ft., upper Skinner 2,604 ft., lower Skinner 2,672 ft., lime 2,790 ft., Red Fork 2,795 ft., Inola 2,958 ft., Bartlesville 2,982 ft., Mississippi lime 3,330 ft., Woodford 3,593 ft., Sylvan 3,618 ft., Viola 3,639 ft., Wilcox 3,685 ft., second Wilcox 3,693 ft.

Hughes County: Stephens Petroleum Co. 1 Turner, SE SE NW 7-6n-10e, 1 mi. S Horn's Corner, elev. 772 ft., dry, TD 4,147 ft., lime 2,264 ft., Booch 2,626 ft., upper Gilcrease 3,234 ft., middle Gilcrease 3,348 ft., lower Gilcrease 3,438 ft., Wapanucka 3,590 ft., Union Valley 3,945 ft., second Cromwell 4,005 ft.

Johnston County: M. W. Bowers 1 Moore, SE SE NE 29-3s-8e, dry, TD 144 ft., granite 140 ft.

Lincoln County: Eason & Co. et al 1 Clark, SW SW SE 30-17n-2e, 3 mi. SE Coyle, elev. 1,018 ft., dry, TD 5,173 ft., Pawhuska 1,730 ft., Tonkawa 2,220 ft., Avant 2,945 ft., Hogshooter 3,525 ft., Layton 3,584 ft., Checkerboard 3,795 ft., Big lime 4,535 ft., Bartlesville 4,615 ft., Mississippi lime 4,662 ft., Woodford 4,690 ft., Hunton 4,730 ft., Sylvan 4,836 ft., Viola 4,926 ft., Wilcox 5,011 ft., Wilcox sand 5,023 ft., second Wilcox 5,146 ft.

Major County: Superior Oil Co. of California 1 Adkins (23-23), NE SW NW 23-21n-10w, 3 mi. S Ringwood, elev. 1,258 ft., dry, TD 7,372 ft., Herrington 2,430 ft., Florence 2,710 ft., Neva 3,118 ft., Pawhuska 3,940 ft., Tonkawa 4,899 ft., upper Layton (Perry gas zone) 5,400 ft., lower Layton 5,910 ft., Checkerboard 6,310 ft., Oswego-Big lime 6,445 ft., unconformity 6,956 ft., top Manning 6,990 ft., base Manning 7,062 ft., Mississippi lime 7,288 ft.

Marshall County: Sohio Petroleum Co. 1 Little, SE SE NE 10-5s-4e, dry, TD 6,432 ft., base Cretaceous-top Pennsylvanian 340 ft., Primrose sand 4,137 ft., Springer shale 4,940 ft.

Murray County: Harwell & Hudspeth, NE NW SE 1-1n-3e, dry, TD 428 ft., lime 390 ft.

Stephens County: Vickers Petroleum Co. 1 Walker, SW NE NE 11-2s-7w, est. elev. 1,097 ft., dry, TD 4,503 ft., tight limy sand 3,932 ft., Simpson 4,105 ft.

# Appalachian Field

## Six Wells Currently Active In Limestone Hill Area

PITTSBURGH.—No deep well completions were reported in the past week. In the Limestone Hill area, West Virginia (Steele district, Wood County), the following wells are active: Godfrey L. Cabot, Inc. 1320 J. H. Brown, drilling at 4,125 ft.; his 1329 O. E. Crow, drilling at 1,105 ft; Columbian Carbon Co. 1148 G. L. Cabot (McLane Tract), 8-in. casing at 2,140 ft.; the company's 1149 S. M. Wigal et al, drilling at 1,470 ft.; Hope Natural Gas Co. 9445 Frank Gilmore, drilling at 2,235 ft; United Fuel Gas Co. 6465 O. H. Blair, drilling at 5,144 ft.

In Dry Fork district, Tucker County, Cumberland & Allegheny Gas Co. 1-A-425 Jason Harman, which drilled through the Oriskany sand with no show of gas, is now at a depth of 8,688 ft. In Portland district, Preston County, Hope Natural Gas Co. 9414 Chas. V. Ringer is drilling at 3,900 ft. In Grant district, Nicholas County, Columbian Carbon Co. 1-GW-1146 G. L. Hughes et al resulted in 3,320,000 cu. ft. of gas, after acidizing, with total depth at 2,077 ft.

In Napier Township, Bedford County, southwest Pennsylvania, South Penn et al, Snee & Eberly 1 Jesse B. Miller is fishing the bailer. The depth of the hole is 7,255 ft. In Georges Township, Fayette County,

Orville Eberly et al 1 N. E. Murphy is running 7-in. casing at a depth of 7,790 ft. In Unity Township, Westmoreland County, Peoples Natural Gas Co. 1-3921 Fred Musnug is shut down at 2,674 ft.

Operations have been resumed at Fox & Trimble's 1 Edward Kite in Garrett County, Maryland. The well, which has been shut down, is drilling at 4,825 ft. The 5½-in. casing, which was pulled, was not rerun. In the same county, Eberly & Snee 1 G. H. Blocher is still shut down at 5,136 ft.

## Texas Gulf Coast

### Austin County Discovery Testing Lower Sands

HOUSTON.—G. S. Hammonds 1 Walter Schneider, new pool discovery in James Cummings Survey, Abstract 31, 5 miles northeast of Cat Springs, Austin County, is reported to be testing lower sands after perforating from 10,589-91 ft. In the upper sand, the well flowed 99 bbl. of 43.8°-gravity oil in 20 hours through ⅛-in. choke.

Fred W. Shield is completing the 1 Mrs. Georgia Heard as a dry-gas producer, to extend Heard field of Bee County 1½ miles to the northwest. On drill-stem test at 4,748-71 ft., the well made dry gas through a ¼-in. choke and developed 1,050 psi. working pressure. Another gas sand was tested at 4,781-80 ft., and the well flowed dry gas through ¼-in. choke and developed 1,100 psi. working pressure. On test from 4,791-97 ft., recovery was 1 gal. of condensate in 9 minutes, using ¼-in. choke and 1,050 psi. working pressure. All tests were run in the Vicksburg formation. The well is located in the Michael, Martin & J O'Toole Survey, 11 miles southwest of Blanconia.

The first gas-condensate production has been opened in the Kountze townsite of Hardin County at L. M. Josey 1 F. C Eason and L. R. Eason, Block 12, J. J. Allums Survey. The well was drilled to a depth of 8,550 ft. and perforated at 7,132-56 ft. Through a 9/64-in. choke, the well flowed 1,250,000 cu. ft. of gas per day plus an ungaged amount of condensate. Flowing pressure on the tubing was 2,500 psi.

**TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS**

Goliad County: New pay at Weesatche—W. O. Woodward 1 Housman & Ranger. John T. Payne Sur., A-232, TD 5,506 ft., top pay 4,756 ft., perf. 4,756-66 ft., IP: 3 bbl. oil per day, 5/64-in. choke, TP 500 psi., 39.6° gravity.

Hardin County: Gas-distillate discovery—American Republics Corp. 1 O. C. Nelson League, O. C. Nelson League, A-40, 8 mi. N of Silsbee, top pay 7,627 ft., TD 8,000 ft., perf. 7,627-32 ft., IP: 50 bbl. distillate per day, 12,000,000 cu. ft. of gas, open flow, SIP 2,565 psi., 50.2° gravity.

Victoria County: New pay at Minnita—Minnie S. Welder 6 Minnie S. Welder, Phillip Dimmit Sur., top pay 4,351 ft., TD 5,350 ft., perf. 4,354-58 ft., IP: 58 bbl. oil per day, ⅛-in. choke, TP 575 psi., CP 1,390 psi.

Wharton County: Gas discovery—Butcher-Arthur, Inc., 1 Albert Thomas, John Bridges Sur., A-73, TD 5,658 ft., perf. 4,401-07 ft., IP: 22,000,000 cu. ft. of gas per day, open flow.

**TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES**

Bee County: Newman Bros. Drilling Co. 1 Ruth Pogue, Sec. 23, Theo. Plummer Subd., of Lott Land, W. A. Butrell Sur., dry, TD 6,500 ft.

Calhoun County: Quintana Petroleum Corp. 1 Lilah Lee Estill, A. Esparza Sur., 2 mi. NE of E. Sheriff field, dry, TD 9,546 ft.

DeWitt County: George H. Echols 1 Kuester, SA&MGRR Co. Sur. 1, A-439, 3 mi. NE of Thomaston, dry, TD 8,509 ft.

Fort Bend County: Harold Link 1 J. M.



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Moore, Jessie Vance Sur., A-91, 7 mi. S of Needville, dry, TD 7,504 ft.

Goliad County: Big Chief Drilling Co. 1 George Hernandez, Ramon Musquiz Sur., 3 mi. W of Cabeza Creek field, dry, TD 9,030 ft.

Harris County: Carter Taylor 1 Howard Johnson, Juan Maldonado, A-589, 20 mi. N of Houston, dry, TD 8,014 ft.

Live Oak County: Atlantic Refining Co. 1 J. E. Lyne, AB&M Sur. 133, A-45, 3 mi. W of Clay West field, dry, TD 9,134 ft.

Matagorda County: Perry R. Bass et al, B-1 Armour Duncan, Benjamine Rawls and O. H. Stout League 17, A-82, dry, TD 9,005 ft.

Refugio County: Southern Minerals Corp. 3 T. F. West, J. Coughlin Sur., A-16, dry, TD 5,503 ft.

Tyler County: American Republics-Houston Oil Co. 1 S. P. Wilson, S. P. Wilson Sur., A-662, 5¾ mi. NE of Village Mills, dry, TD 10,710 ft.

Wharton County: Edwin Nielsen 1 Cecelia Swanson, ET RR Sur., A-515, 7 mi. SE of El Campo, dry, TD 7,618 ft.

## California

### Kern County Well Rated At 3,500 Bbl. Daily

LOS ANGELES.—Pacific Western Oil Corp. and Tide Water Associated Oil Co. have completed their 82A-31 Rankin for a flowing producer rated at 3,500 bbl. daily to give Belgian Anticline field of Kern County either a ½-mile south extension or an entirely new pool.

Bottomed at 5,495 ft., on a 6-hour gage the discovery flowed at this rate through a ½-in. choke and perforations at 5,400-93 ft. Oil gravity was 35° A.P.I. and flowing pressure on the tubing 875 psi. The well is believed to be producing from a new fault block, but it may prove to be an extension to the Eocene "84" pool of Belgian Anticline. Tentatively the new discovery, located in Section 31-30s-22e, is being called Telegraph Hill pool.

In Morales field of northwestern Cuyama Valley, two new producers were in the process of being completed in the 2-month-old Clayton pool. These will extend production from the 1,800-ft. pay two locations west. Both were drilled by Southern California Petroleum Co., its No. 1-10 and 3-10 Shlaudeman. Completion of Bishop Oil Co. 67-10 Chorum for a 60-bbl. producer in the Morales sand gave the pool a two-location extension to the south, also.

Currently, seven wildcats are drilling in the valley, the bulk being located on the southeastern end in San Luis Obispo County. Two are being drilled by Richfield Oil Corp., while Hancock Oil Co., Mohawk Petroleum Corp., Northwest Cuyama Valley Oil Co., Rothschild Oil Co., and Seaboard Oil Co. each have one. In addition Honolulu Oil Corp. very shortly will get under way with its No. 1 Honolulu-Oceanic in the southeastern end.

A quarter mile west of Russell Ranch production, Charles Holmes has suspended operations on No. 1 "Well" after drilling to 1,026 ft. Also just outside the western edge of the field, Richfield abandoned its No 35-36 Anderson at 1,153 ft.

At Guijarral Hills in Fresno County, northern San Joaquin Valley, Barnsdall Oil Co. has suspended operations at No. 41-2-19 Dessel after extensive testing. Drilled to a total depth of 10,655 ft., the most recent zone tested was above 9,969 ft. with only water being recovered. Drilled from an elevation of 632 ft., tops of various markers found were: Kreyenhagen 8,542 ft., Leda 8,626 ft., Domengine grit 10,021 ft., and Hondo at 10,631 ft.

**CALIFORNIA WILDCAT FAILURES**

Fresno County, Burrel area: L. M. Lockhart 1-28 Burrel, 28-16s-18e, dry, TD 6,800 ft., elev. 207 ft. L. M. Lockhart 1-27

Sample, 27-16s-18e, dry, TD 6,700 ft., elev. 207 ft.

Kern County, Calder area: General Petroleum Corp. 54-26 Kopps, 26-29s-25e, dry, TD 9,484 ft., elev. 335 ft.

Comanche Point area: L. C. Gould 36-1 Tejon, 36-32s-29e, dry in granite, TD 1,285 ft., elev. 873 ft.

Merced County, El Nido area: Western Gulf Oil Co. 1 Potter, 17-9s-13e, dry, Kreyenhagen 3,148 ft., Moreno 5,315 ft., granite 8,348 ft., TD 8,374 ft., elev. 111 ft.

Riverside County, East Corona area: Peter Palm 1 "Well," 28-4s-6w, dry, TD 825 ft., elev. 1,005 ft.

San Luis Obispo County, Carrizo Plains area: Texas Co. 3 Grayson-Owen, 13-31s-18e, dry, TD 3,520 ft., elev. 2,104 ft.

Santa Barbara County, North Goleta area: L. H. Cameron 1 Marty, 24-5n-29w, dry, TD 1,502 ft., elev. 400 ft.

Solano County, Goodyear area: G. T. Cameron 1 Griffin, 16-3n-2w, dry, TD 2,430 ft., elev. 13 ft.

Ventura County, Ventura Ave. area: Los Nietos Co. 88-14A Fraser, 14-3n-23w, dry, TD 14,596 ft., elev. 1,070 ft.

**CALIFORNIA SUCCESSFUL WILDCAT**

Kern County, Tunis Creek field: D. K. Associates 73-29 Corral, 29-11n-13w, flowed 229 bbl. of 33°-gravity crude in 11 hr., Valv. shale 1,120 ft., gray sand 1,432 ft., "unnamed" oil sand 1,564 ft., bottom oil sand 1,675 ft., TD 1,740 ft., elev. 845 ft. New deeper sand discovery.

**NEVADA WILDCAT**

In White Pine County, Nevada, and some 45 miles west of Ely, Continental Oil Co. is drilling ahead at No. 1 Meridian Unit. Sponsored jointly by Continental and Standard Oil Co. of California, at the weekend hole had been carried to below 2,245 ft. Scheduled depth of the wildcat, located in Section 31-16n-56e, is about 7,500 ft.

# Rocky Mountain

## Trigood Finds Oil Shows In Merino Area Wildcat

DENVER.—Shows of oil have been logged in sands of the Cloverly series by Trigood Oil Co. at its wildcat 1 Couch, SE SE SE 19-6n-54w, in the Merino area, southwest of the town of Sterling, Logan County, Colorado. On drill-stem test the operator recovered 150 ft. of oil-cut mud.

The zone tested was around 5,100 ft., and the operator is coring in saturated sand below this depth. The First Bench of sand was found at 5,056 ft., and this showed fluorescence and light oil staining in cores, but a test between 5,056-5,066 ft. had no oil recovery. Staining was logged in cores, and another test was made at around 5,080 ft.

This wildcat is located on a seismic high, and the block was farmed out by Ohio Oil Co. to Trigood for a one-half interest with one free well to Ohio. This is Trigood's first drilling in the northeastern Colorado area, although the company had an interest in a Fred M. Manning, Inc., failure some 8 miles northeast of the present test. The wildcat is 25 miles southwest of a recent British-American Oil Producing Co. discovery in the Armstrong area and 15 miles from British-American's new location in the Walker area.

Stanolind Oil & Gas Co. has recemented casing at its 1 Ute Indian, C SE NE 18-33n-7w, wildcat in the Ignacio area, LaPlanta County, Colorado. The well is at 2,732 ft., reportedly below the Pictured Cliffs sand, and 9⅝-in. casing was cemented at 2,716 ft. In drilling below that depth the operator still found the mud highly gas cut, and decided to recement with 200 sacks. This well blew out, flowing an estimated 5,000,000 cu. ft. of gas daily, from a zone between 2,440-45 ft., and also found considerable gas in cores of the Pictured Cliffs zone. The well is projected as a Dakota sand test, but is considered commercial for gas from the present zone.

At Massadona, wildcat between Rangely and Elk Springs fields in northeastern Colorado, Seaboard Oil Co. of California tested water and is now coring ahead. The well is 63-12-G, NE SW NE 12-3n-100w, and on drill-stem test 3,562-3,593 ft. the well made 3,380 ft. of sulfur water in 1 hour with 1,500 psi. flowing pressure and 1,600 psi. shut-in pressure. Seaboard is now coring below 3,593 ft. At this depth the well may be in Weber sandstone as cores from 3,593 ft. showed oil and water-stained sand. Cores above that zone were limestone with streaked dead-oil staining. This wildcat is in an area where Seaboard core drilled and did seismic work.

**WYOMING SUCCESSFUL WILDCAT**

Sussex, Johnson County: Continental Oil Co. 15 Unit, SE NE SW 15-42n-78w, 7,821 TD; PB 4,660 ft., perforated 4,604-4,642 with 120 shots; reperforated 4,604-4,642 with 119 shots; estimated pumping potential 60 bbl. oil per day from Shannon; 7-in. casing at 6,408; Parkman 3,300 (?), Steele 3,515, Sussex 4,097, Shannon 4,603, Niobrara 5,802, first Wall Creek 6,407, Dakota 7,698, Lakota 7,776.

**WYOMING WILDCAT FAILURE**

Chimney Rock, Laramie County: Hooker-DeMohrenschildt 1 Govt., N WNW SE, 35-18n-70w, 5,195 TD; abd.; Niobraba 3,591, Timpas 4,176, Codell 4,191, Muddy 5,150.

**UTAH WILDCAT FAILURE**

Rush Lake, Iron County: Southern Utah Oil 1 fee, NE NE SW 9-34s-11w, 4,020 TD; PB 3,100; suspended indefinitely; 7-in. casing at 3,750.

**NEBRASKA WILDCAT FAILURE**

North Platte, Lincoln County: A. R. Jones


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et al 1 Hanson, SE SW NW 24-15n-31w, 3,270 TD; abd., Green Horn 1,404, Dakota 1,540, Lakota 2,018, Permian 2,850, Ft. Hayes 1,210, Carlyle 1,230.

# Kansas

## Discoveries Continue in Southeast Graham Area

DISCOVERIES in the active southeastern Graham County area continue at a rapid pace. C-G Drilling Co. and D. G. Hanson have completed their 1 Bass, NW NW SW 12-10-21, with a potential of 128 bbl. per day on the pump to open the Bass pool. It is about a mile southwest of the Muillenburg pool and about 3 to 4 miles south of the Morel pool. Production is from the Arbuckle at 3,826-31 ft. (1,554-59 ft.).

About a mile northwest and 3 miles west of the Morel pool, in the NW NW NW 11-10-21, Jones, Shelburne & Farmer have another prospective new pool where their 1 Miller recovered 1,700 ft. of clean oil in a 30-minute drill-stem test at 4,841-49 ft. in Arbuckle, topped at 3,839 ft. (—1,556 ft.). Casing has been run to 3,841 ft. for completion. This well also has good oil showings in Lansing lime, topped at 3,525 ft.

About 1½ miles further northwest in the NE NE SW 4-10-21, Heathman Drilling Co. 1 Abriam swabbed at the rate of 14 bbl. per hour in starting tests of Arbuckle lime to open another new pool for the area. Top of the Arbuckle in this well is 3,870 ft. (—1,568 ft.). Casing was run 2 ft. in the top, leaving 1 ft. of open hole. After drilling out, the well filled 1,250 ft. of oil in the first hour. It swabbed from 1,500 ft. off bottom. It is about a mile north of the Teall pool and about the same distance southeast of the Smith-Denning pool.

Five miles southeast of their Bass discovery well, C-G Drilling Co. and D. G. Hanson are testing another wildcat, their 1 Sutor, SE SE SW 23-9-22. The well got salt water in the Arbuckle at 3,907-19 ft., but plugged back to 3,816 ft. and perforated casing in the Lansing-Kansas City zone at 3,756-60 ft. With 500 gal. of acid injected, the well swabbed at the rate of 2½ bbl. of oil per hour. With an additional 3,000 gal. of acid, the well swabbed 10 bbl. of oil per hour. Top of the Lansing was 3,564 ft. (—1,206 ft.). This discovery is on a direct line between the new Fargo pool, a little more than a mile to the north and slightly west, and the recently opened Wild Horse Creek pool, about 2½ miles to the southeast.

### KANSAS SUCCESSFUL WILDCATS

Harper County: Deep Rock Oil Corp. 1 Stoddard, SW SW SW 17-31s-8w, elev. 1,634 ft., 1,532,500 cu. ft. of gas per day from Mississippian topped at 4,391 ft., shut in, TD 4,975 ft., Simpson 4,809 ft., Arbuckle 4,940 ft.

Rice County, Prosper area: Lewis et al 1 Gouldner, NW NW SE 5-18s-9w, elev. 1,750 ft., 168 bbl. of oil per day from, Arbuckle at 3,222-38 ft., TD; Heebner 2,748 ft., Lansing 2,889 ft.

Russell County, NW Dillner area: Blair 1 Cook, NW NW SE 26-13s-15w, elev. 1,890 ft., 46 bbl. of oil per day from Lansing at 3,051-66 ft., TD 3,074 ft., anhydrite 850 ft., Topeka 2,115 ft.

Saline County: Carey et al 1 Swenson, NE NW SW 34-15s-3w, elev. 1,292 ft., pumped 30 bbl. of oil per day from Viola topped at 3,340 ft., TD 3,368 ft., Lansing 2,162 ft., Mississippian 2,894 ft., Kinderhook 3,040 ft., Hunton 3,201 ft., Sylvan 3,223 ft., Maquoketa 3,282 ft.

### KANSAS WILDCAT FAILURES

Barton County: Anschutz 1 Dryden, NE NE SE 9-17s-14w, elev. 1,918 ft., dry, TD 3,464 ft., Heebner 3,082 ft., Lansing-Kansas City 3,150 ft., Sooy 3,379 ft., Arbuckle 3,414 ft.

Alpine et al 1 Hammeke, NW NW SE 7-19s-12w, elev. 1,868 ft., dry, TD 3,496

ft., Heebner 3,068 ft., Lansing-Kansas City 3,192 ft., Sooy 3,434 ft., Arbuckle 3,446 ft.

Lauck 1 Schartz, NW NW NE 8-19s-12w, elev. 1,818 ft., dry, TD 3,435 ft., Heebner 2,998 ft., Lansing-Kansas City 3,123 ft., Sooy 3,380 ft., Arbuckle 3,402 ft.

Brack 1 Weiss, SW SW SE 9-19s-12w, elev. 1,849 ft., dry, TD 3,438 ft., Lansing-Kansas City 3,151 ft., Sooy 3,406 ft., Arbuckle 3,434 ft.

Republic Natural et al 1 Koopman, NW SW NE 35-19s-13w, elev. 1,839 ft., dry, TD 3,520 ft., no tops reported.

Butler County: Rex & Morris 1 Heymann, SE SW SE 33-23s-5e, elev. 1,441 ft., dry, TD 2,557 ft., Mississippi lime 2,420 ft., Kinderhook 2,450 ft., Viola 2,555 ft.

Cowley County: Parker 1 Krueger, SW SE NW 6-30-3e, elev. 1,286 ft., dry, TD 3,468 ft., no tops reported.


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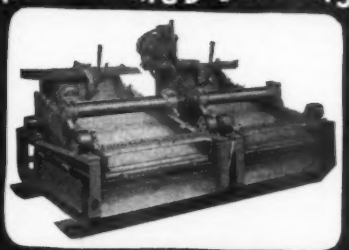

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Edwards County: Continental Grover, SW NW SW 34-25s-20w, elev. 2,234 ft., dry, TD 5,266 ft., anhydrite 1,280 ft., Heebner 3,950 ft., Lansing-Kansas City 4,080 ft., Viola 4,880 ft., Simpson 5,067 ft., Simpson dolomite 5,093 ft., Arbuckle 5,113 ft.

Lyon County: Lance Hill et al 1 Redecker, NE NE NE 17-20s-12e, dry, TD 2,565 ft., Kinderhook 2,330 ft., Misener 2,439 ft., Viola 2,440 ft., Simpson 2,497 ft., Arbuckle 2,547 ft.

Phillips County: Peters et al 1 Skelton, NW NE NW 20-1s-19w, elev. 2,151 ft., dry, TD 3,615 ft., anhydrite 1,830 ft., Topeka 3,166 ft., Heebner 3,388 ft., Lansing-Kansas City 3,416 ft.

Reno County: Cities Service 1 Zimmerman, NW NW SE 21-25s-6w, elev. 1,473 ft., dry, TD 4,070 ft., Arbuckle 4,039 ft.

Rooks County: Veeder et al 1 Johnston, NE NE SW 9-6s-19w, elev. 2,137 ft., dry, TD 3,700 ft., Topeka 3,120 ft., Heebner 3,322 ft., Toronto 3,342 ft., Lansing-Kansas City 3,362 ft., Sooy 3,627 ft., Arbuckle 3,630 ft., granite 3,697 ft.

Russell County: Ferrell et al 1 Keeney, SW SW NE 28-12s-15w, elev. 1,868 ft., dry, TD 3,371 ft., Topeka 2,736 ft., Heebner 2,992 ft., Toronto 3,014 ft., Lansing-Kansas City 3,040 ft., Sooy 3,315 ft., Arbuckle 3,333 ft.

Wabaunsee County: Adams et al 1 Adams, CNL SW NE 14-11s-12e, elev. 1,122 ft., dry, TD 3,094 ft., Lansing 1,138 ft., Kansas City 1,264 ft., Marmaton 1,490 ft., reworked Mississippi lime 2,220 ft., Mississippi lime 2,255 ft., Kinderhook 2,431 ft., Hunton 2,636 ft., Maquoketa shale 2,906 ft., Viola 2,978 ft.

Jones-Shelburne & Farmer 1 Joss, SE SW SW 4-13s-10e, elev. 1,437 ft., dry, TD 3,430 ft., Mississippi lime 2,649 ft., Kinderhook 2,920 ft., Hunton 3,102 ft., Maquoketa 3,315 ft., Viola 3,389 ft.

## North Central Texas

### Throckmorton Producer Has 527-Bbl. Potential

WICHITA FALLS.—Completion last week of Mobile, Inc., and J. C. Roberts 1 Everett-Roberts-Montgomery Unit, 8 miles southwest of Throckmorton, from the Caddo limestone, opened a new pool or extended the Condron-Davis Caddo field about 1 mile to the southwest. The new well and the field, however, are separated by a dry hole. The discovery flowed 175.52 bbl. of oil in 8 hours through ¼-in. choke, for a calculated daily potential of 526.56 bbl. of oil. Other formation tops besides the Caddo were: Barnett 4,650 ft., Chester 4,689 ft., and according to field sources, it was in the Mississippian at total depth of 4,789 ft. No top on that formation had been reported.

In southwestern Clay County, Ted Weiner 1 F. L. Brown, Block 2, Hopkins County School Land Survey, was showing for new Strawn production. Location is 2 miles west of Bruns-Beacon Strawn field. On a 1-hour drill-stem test at 4,684-4,721 ft. gas showed in 17 minutes and recovery was 210 ft. of clean oil, plus 210 ft. of oil-cut mud. Operators ran electrical surveys and prepared to complete.

Baylor County's first Caddo oil producer, J. J. Lynn 1 First National Bank of Fort Worth, completed this week for a flowing potential of 267 bbl. of 40°-gravity oil a day, from pay at 5,088-99 ft. Location is Block 197, T&NO Survey, 10 miles east of Seymour. The same operators' 1-B Claude Cowan, 1 mile to the south in Block 20, T&NO Survey, was drilling at 3,790 ft. in shale.

**NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS**

Callahan County: Creslenn Oil Co. 1 Fred Cutbirth, Bartola Garcia Sur. 208, 10 mi. W Cross Plains, TD 4,102 ft., elev. 1,948 ft., Ellenburger 4,074 ft., pay 4,084


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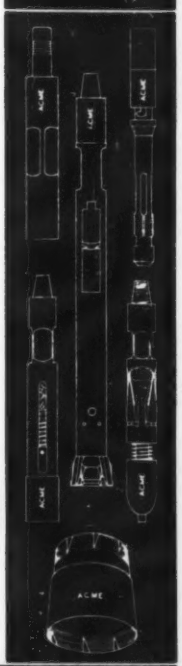

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ft., pumped 34.95 bbl. of 40°-gravity oil a day.

Fisher County: Roeser & Pendleton, Inc. 1 Mose Newman Industries, 8-20-T&P, 5 mi. NW Eskota, TD 5,633 ft., elev. 2,113 ft., sand 5,613 ft., flowed 100.6 bbl. of 43°-gravity oil a day, 10/64-in. choke, GOR 1,820 cu. ft., CP 1,350 psi.

Jones County: Exploration Oil & Gas Co. et al 1 J. P. Bingham, Blk. 1, League 359, Goliad CSL, 14 mi. W Anson, TD 3,298 ft., PB 2,910 ft., elev. 1,847 ft., Flippen pay 2,845 ft., pumped 40 bbl. of 37°-gravity oil a day.

Sohio Petroleum Co. 1 J. G. Whaley, Sec. 65, SPRR Sur., 6 mi. NE Hamlin, TD 3,146 ft., elev. 1,665 ft., Swastika sand pay 3,136 ft., flowed 320.6 bbl. of 40.8°-gravity oil a day, ¼-in. choke, GOR 505 cu. ft., CP 400 psi., TP 225 psi.

Throckmorton County: Mobile, Inc. and J. C. Roberts 1 Everett-Roberts-Montgomery unit, Sec. 1,621, TE&L Sur., 8 mi. S Throckmorton, TD 4,789 ft., elev. 1,369 ft., Caddo pay 4,144 ft., flowed 175.5 bbl. of 41°-gravity oil in 8 hr., ¼-in. choke, GOR 1,462 cu. ft., CP 820 psi., TP 440 psi.

**NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES**

Archer County: Forest Oil Corp. 1 W. C. Thomas, J. Blessing Sur., A-975, 2½ mi. W Archer City, dry, TD 3,962 ft.

Henry Grace Production Co. 1 P. J. Kelly, Blk. 68, John Harris Subd., Club Ranch, 5 mi. WNW Archer City, dry, TD 1,468 ft., Gunsight lime 1,392-95 ft.

Southern Petroleum Exploration et al 1 L. F. Wilson "C," Lot 2, Blk. 66, ATNCL Sur., 8 mi. N. Archer City, dry, TD 1,452 ft.

Frank Wood 1 L. W. Mangold Trust, Blk. 5, Mangold Subd., ¼ mi. N Mankins, dry, TD 2,016 ft. in shale.

Brown County: Trumpter Oil Co. 1 Carmichael & Foster, 725 ft. from E, and on line of Sec. 57 and 58, HT&B Sur., 2½ mi. NE Owens, dry, TD 3,005 ft., Caddo 2,285 ft., Marble Falls 2,472 ft., Ellenburger 2,685 ft.

Clay County: S. D. Johnson 1 Clara Gragg, McKinney & Williams Sur., A-359, 5½ mi. SE Windthorst, dry, TD 5,664 ft.

Foard County: S. D. Johnson 1 F. Halsell, Sec. 1, ETRR Sur., 5½ mi. E Foard, dry, TD 4,020 ft., elev. 1,413 ft., reef 3,704 ft., porosity 3,715 ft. and 3,746 ft.

Haskell County: Deep Rock Oil Corp. 1 Hewitt, 220-45-H&TC, 1 mi. E O'Brien, dry, TD 6,115 ft., elev. 1,573 ft., Caddo 5,572 ft., Mississippian 5,828 ft., Ellenburger 6,048 ft.

Jones County: Edward C. Lawson 1 J. B. Young, Hill & Walton Sur., 2 mi. SE Radium, dry, TD 3,113 ft., Coleman Junction 1,700 ft., Dotham 2,130 ft., Saddle Creek 2,470 ft., Flippen sand 2,524 ft.

The Texas Co. 1 R. S. Turner, Sec. 6, Orphan Asylum Lands, 6 mi. SW Luders, dry, TD 2,315 ft., elev. 1,632 ft., Saddle Creek 1,914 ft., Flippen 1,985 ft., Hope 2,114 ft., King sand 2,264 ft.

Wheeler & Ingraham 1 Thomas Finch, 20-17-T&P, 1½ mi. W Hodges, dry, TD 2,774 ft.

Knox County: Johnston Oil Co., Inc. 1 J. H. Cooksey, 6-2-D&W, 2½ mi. N Goree, dry, TD 1,776 ft.

Lampasas County: Sherman, Nelson & Seguin 1 Henrietta Franks, Austin CSL Sur., 3 mi. SW Adamsville, dry, TD 2,601 ft. in black shale, elev. 1,150 ft.

Montague County: M. T. Flanagan & J. W. Modesett 1 J. G. Cannon, Edward O'Conner Sur., A-580, 10 mi. N St. Jo, dry, TD 2,605 ft.

Palo Pinto County: Ernest Loyd 2 Mrs. Helen H. Johnson, Sec. 1,722, TE&L Sur., A-497, 5½ mi. NW Graford, dry, TD 1,835 ft., elev. 1,083 ft.

Shackelford County: G. E. Kadane & Sons 1 Stokes, Sec. 1,572, TE&L Sur., A-473, 10 mi. E Albany, dry, TD 4,454 ft., elev. 1,269 ft., Caddo 3,627 ft., Ellenburger 4,400 ft.

Starr Oil Co. 5 J. D. Windham "H," 80-12-T&P, 15 mi. SW Albany, dry, TD 4,476 ft., elev. 1,773 ft., Caddo 4,137 ft., Ellenburger 4,633 ft.

Taylor County: Taubert Drilling Co. 1 Loyd Perry, Sec. 5, Blk. 4, Burr & Caswell Sur., 10 mi. S Merkel, dry, TD 3,420 ft. in shale.

Throckmorton County: Deep Rock Oil Corp. 1 J. R. Cribbs, Sec. 3,014, TE&L Sur., 4 mi. NW Elbert, dry, TD 5,379 ft., Mississippian 4,959 ft., Ellenburger 5,240 ft.

Wichita County: J. R. Frankel 2 C. E. Robertson, Red River Valley Lands Sur., 2¼ mi. S Burkburnett, dry, TD 645 ft., sand with oil show 491 ft., sandy shale with oil show 616 ft.

# Southwest Texas

## Pool Opener Gages 163 Bbl. Per Day on Test

CORPUS CHRISTI.—J. S. and R. H. Abercrombie have run a potential gage on the 1 A. E. Nelson, oil discovery well approximately 2½ miles northwest of Taft in San Patricio County. The well recorded a flow of 163 bbl. of 23.8°-gravity oil per day through a 9/64-in. choke. Production is through perforations at 6,666-69 ft. The well was drilled to a depth of 7,471 ft. and plugged back to 6,673 ft. for completion. Tubing pressure was 1,550 psi. and casing pressure was 2,480 psi. The new pool opener is located in the Juan Garcia Survey, Abstract 129 of the Coleman-Fulton Pasture Co. Farm 11. The field will be known as "Triple A" field.

Ten miles north of Freer, in McMullen County, Stanolind Oil & Gas Co. has opened a new gas-condensate field at its 1 Hagis Ranch, R. W. Mills Survey. The well produced 34,000,000 cu. ft. of gas per day on open flow. plus an unestimated amount of condensate. Gravity of the condensate was 49.3°. Production is through perforations at 7,696-704 ft. Through a ¼-in. choke, the well flowed 4,795,000 cu. ft. of gas per day, with tubing pressure at 2,664 psi. and casing pressure at 2,777 psi.

Ryan, Hays & Burke are coring ahead after running an electric log to 6,000 ft. in the 3 George T. Jambers, wildcat test in the Jambers area of McMullen County. Operators cored a sand below 5,835 ft. in the well and tested salt water. The field sand shaled out. Test is located in the James Freal Survey 155, Abstract 189.

In Webb County, Sunray Oil Corp. 1 O. W. Killam, wildcat test in GC&SF RR Survey 1,808, 14 miles east of Laredo, is drilling below 13,701 ft. The wildcat has a projected depth of 15,000 ft.

**SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS**

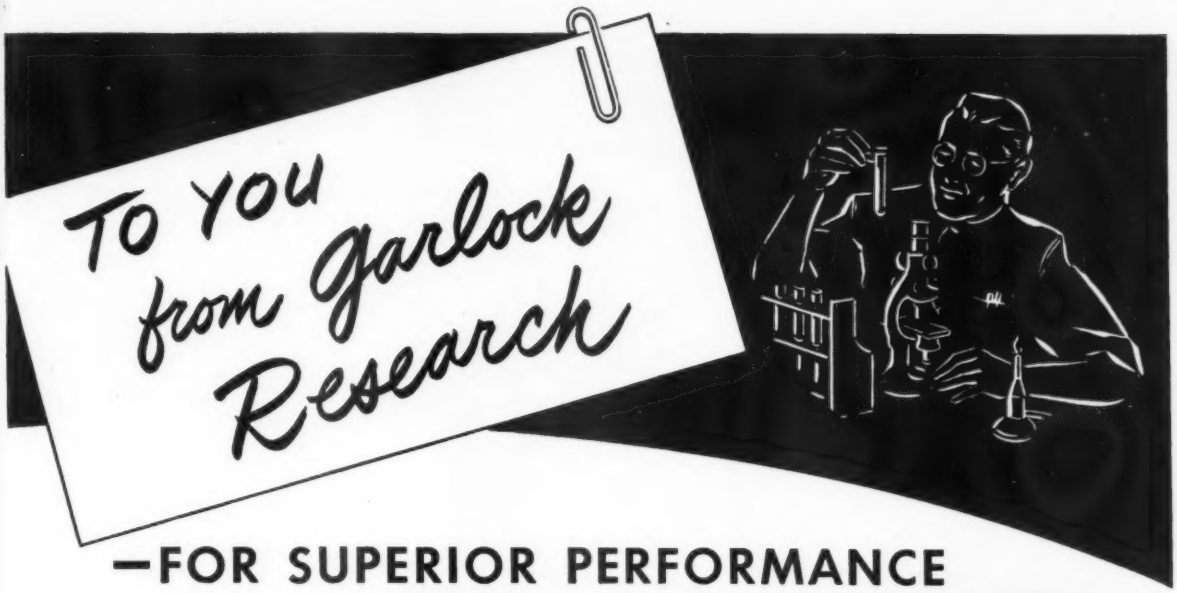
Jim Hogg County: Gas discovery—Humble Oil & Refining Co. 1 Eduardo Izaguirre, Tract 1, Agua Nueva de Abajo Grant, 8 mi. NW of Santa Elena, TD 7,500 ft., perf. 7,380-400 ft., IP: 2,000,000 cu. ft. of gas per day, open flow.

Jim Wells County: Gas discovery—Hickok & Reynolds Roy Co. 1 Reynolds & Richardson, W. O. Stamples Sur. 210, A-439, 7 mi SE of Alice, TD 6,100 ft., perf. 3,927-33 ft., IP: 11,000,000 cu. ft. of gas per day, open flow.

McMullen County: Gas-condensate discovery—Stanolind Oil & Gas Co. 1 Hagist Ranch, Inc., R. W. Mills Sur., 10 mi. N of Freer, TD 8,021 ft., perf. 7,696-704 ft., top pay 7,696 ft., IP: 34,000,000 cu. ft. of gas per day, open flow, condensate ungaged, 59.3° gravity, SITP 2,922 psi., SICP 2,934 psi.

San Patricio County: Oil discovery—"Triple A"—J. S. Abercrombie and R. H. Abercrombie 1 A. E. Nelson, Juan Garcia Sur., A-129, top pay 6,652 ft., TD 7,471 ft., perf. 6,665-69 ft., IP: 163 bbl. of oil per day, 9/64-in. choke, 23.8° gravity, TP 1,550 psi., CP 2,480 psi.

Starr County: New pay at Frost—Sun Oil Co. A-2 A. Orive, Porcion 97, TD 4,158 ft., top pay 4,145 ft., perf. 4,145½-47 ft.,

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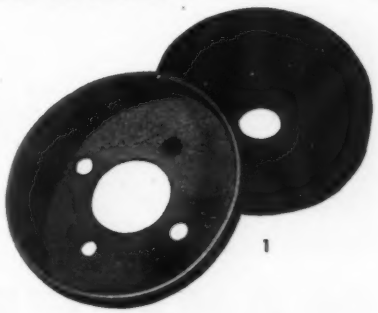
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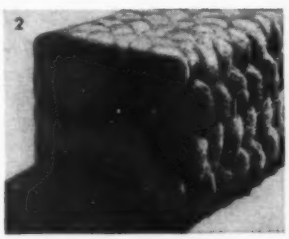
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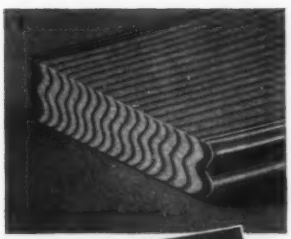

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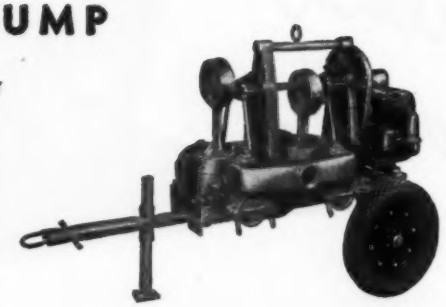

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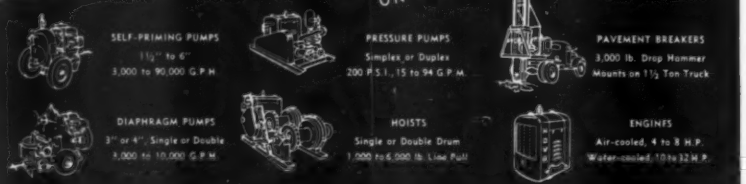


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**SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES**

Atascosa County: Rowan & Hope 1 Dick Prassel, W. W. Robins Sur. 6, A-1,321, 3 mi. N of Charlotte, dry, TD 4,811 ft.

Bastrop County: E. R. Marts 1 J. W. Patton, Solomon Duty Sur., near Weberville, dry, TD 1,992 ft.

Frio County: Kirkwood & Morgan, Inc. 1 Ellis H. Bruff, Anton Andres Sur. 1,358, A-17, 2 mi. NE of Bigfoot, dry, TD 2,624 ft.

Jim Hogg County: Goldston Oil Corp. 1 Moody Ranch, Fowler & Rankin Subd., El Sordo Grant, 10 mi. S of Hebbronville, dry, TD 4,500 ft.

Kleberg County: Humble Oil & Refining Co. G-4 King Ranch-E. Laureles, Laguna Larga area, Rincon de Los Laureles Sur., 15 mi. S of Corpus Christi, dry, TD 8,988 ft.

Nueces County: Morris Cannan 1 Walter Schultz, Blk. 1, Sec. 3, S. Ross Peters Subd., dry, TD 6,544 ft.

San Patricio County: Henshaw Bros. & O. R. Mitchell 1 H. H. Black, Sec. 59, Geo. H. Paul Subd. of J. J. Welder Ranch, dry, TD 6,520 ft.

Webb County: Orlee Oil Co. 1 Rosa V. Benavides, Blk. 8, Sec. 5, Cole Subd., Los Angeles Grant, Josefa Cueller Sur., dry, TD 2,502 ft.

Willacy County: Humble Oil & Refining Co. 5 Sauz Ranch-Tenerias, No. Willamar area, San Juan de Carricitos Grant, dry, TD 10,000 ft.

Zapata County: G. H. McKay, Trustee, 1 Refugio Guitterrez, Porcion 23, 6 mi. NE of Lopena, dry, TD 3,808 ft.

## Mississippi

### Second Oil Discovery in Alabama Made by Humble

JACKSON.—The second oil-field discovery in the history of the State of Alabama has been completed at Humble Oil & Refining Co. 1 Marion Davies, et al, 15-3n-2e, Clarke County. On initial potential, the well pumped 80 to 100 bbl. of 18.2°-gravity oil per day through perforations at 5,419-29 ft. The well was drilled to a total depth of 8,093 ft. The new field will be known as "Carlton field."

In Pickens field, Yazoo County, Mississippi, Carter Oil Co. 1 R. M. Bridgforth, 30-12n-3e, west offset to Carter's Lower Cretaceous discovery, was cored at 7,743-48 ft., with recovery being 1 ft. of porous sand with good show of oil and 4 ft. of tight sand with porous streaks. A drill-stem test was run at 7,738-48 ft. using ¼-in. top and bottom chokes and 480 ft. of water cushion. Tool was left open 20 minutes with recovery being the water cushion and 50 ft. of mud cut with oil, gas, and salt water. Bottom-hole flowing pressure was 365 psi. Another drill-stem test was run at 7,748-58 ft. with no shows.

In West Lincoln field, Lincoln County, Mississippi, Lion Oil Co. is currently running drill-stem test at total depth of 10,666 ft. in its 1 M. E. Allred, direct south offset to the discovery well. Approximately 13 ft. of sand with show of oil were cored from 10,650-66 ft. Two dry holes were drilled in West Lincoln field shortly after the discovery in April of this year.

**MISSISSIPPI WILDCAT FAILURES**

Adams County: Danciger and William Helis 1 George Armstrong, 7-5n-2w, dry, TD 6,755 ft.

Yazoo County: E. P. Thomas and C. G. Raible, et al, 1 Susie Ingram, et al, 1-12n-2w, dry, TD 6,593 ft.

**ALABAMA SUCCESSFUL WILDCAT**

Clarke County: New oil pool—Humble Oil & Refining Co. 1 Marion Davies, et al,

15-3n-2e, TD 8,093 ft., top pay 6,610 ft., perf. 6,610-13 ft., IP: 80 bbl. oil per day, on pump, 18.2° gravity.

**FLORIDA WILDCAT FAILURE**

Baker County: Natural Turpentine & Pumpwood 1 fee, 7-4s-19e, dry, TD 3,043 ft.

## Ohio Fields

### Tests Indicate Extension Of Baker Pool to North

COLUMBUS.—Indications of a north extension to Baker pool in Hopewell Township, Perry County, was found by the L. L. Dittoe 5 Dora Swinehart, Sec. 27. A good oil showing in the Clinton, logged at 2,966-96 ft., made 115 bbl. in 24 hours after an 85-qt. shot. An offset to the west has been approved.

Another nice gasser for the shallow field was brought in by Harry Clymer on 1 Clarence Dimmerling, Sec. 21, Enoch Township, Noble County. The Macksburg 800 was topped at 1,030 ft. and drilling stopped at 1,035 ft. with an open flow of 850,000 cu. ft. natural.

E. M. Shields 1 Elfie Pyers, Section 9, Prairie Township, Holmes County, found the lower Clinton at 3,240-57 ft. with 375,000 cu. ft. natural. When shut in after shot, the gage had increased to 505,000 cu. ft. The well is more than ½ mile north of the Wengert and indicates a fair sized pool.

Wildcat drilling is increasing and three additional tests have been reported. J. A. Upham has a rig built on the 1 Ed Spring, Lot 18, Goshen Township, Tuscarawas County. Status Development Co. has staked a location on R. J. McIntire, Section 29, Monroe Township, Carroll County, and John Galey et al have a location on J. Shipley, Lot 33, Ravenna Township, Portage County.

## Eastern Texas

### Kaufman County Venture Has Woodbine Shows

DALLAS.—In Kaufman County, T. D. Humphrey 1 N. E. Tharp, located on a 177-acre tract in the D. Cervantes Survey, A-79, 4 miles southeast of Kemp, topped the Woodbine at 3,450 ft. and reported shows of oil to the lower Woodbine at 3,612 ft. A 45-minute drill-stem test from 3,410-18 ft. recovered 40 ft. of oil-cut mud. Operators reported the test as being unsatisfactory, mechanically. At last report it was waiting on orders to run casing to 3,648 ft., total depth, and perforate.

On the west side of Earl Lee field, Wood County, Hollandsworth Oil Co. prepared to core ahead for the Woodbine pay at its 1 Carlisle in the Fisher Survey. At last report the well was below 5,585 ft.

On the north side of Pine Mills, Superior Oil Co. 1 Wagoner, Gilliland Survey, had salt water with no oil shows, from perforations at 5,506-16 ft.

R. J. Caraway 1 W. F. Eckhart, northwest corner of the W. H. Smith Heirs Survey, Navarro County, ran a 1-hour drill-stem test from 5,142-54 ft., using ⅜-in. bottom and ¼-in. top chokes. Recovery was 45 ft. of oil-cut mud. Operators continued drilling below 5,180 ft. Projected depth was 6,500 ft. Previous drill-stem tests were: 2,924-27 ft., produced a good blow of gas and recovered 90 ft. of heavily gas-cut mud with a light show of oil; from 4,464-72 ft., recovery was 60 ft. of oil and gas-cut mud, and from 4,508-40 ft. recovery was an undisclosed amount of oil and gas-cut mud.

Humble Oil & Refining Co. has staked location for its 1 Jewell Burford and others,


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660 ft. out of the southeast corner of a 78-acre tract, and 660 ft. out of the same corner of the D. O. Williams Survey. Proposed depth was 7,000 ft., which is expected to test the Travis Peak.

**EAST TEXAS (DISTRICTS 5, 6, AND 6-P) WILDCAT FAILURE**

Robertson County: E. C. Johnston 1 W. R. Martin, W. R. Cox Sur., 1 mi. N Easterly, dry, TD 1,756 ft.

# Michigan

## Billings Dundee Oil Field Gets Detroit River Show

MOUNT PLEASANT.—What may prove to be an important Detroit River oil show was under test at Socony-Vacuum Oil Co., Inc., B-3 McCrandall, SW NW SW 2-17n-1e, first deeper horizon oil test in Billings Dundee field, Gladwin County. Test carried about 1,800 ft. of fluid from an interval at 4,078-91 ft. after a 3-day fill-up period.

On the basis of early reports this pay appeared to be from the so-called "sour" zone found in other north central basin areas where wells have been drilled to the Richfield beds. The crude in this well, as well as the gas, appeared to be of a somewhat "sweeter" type than has been found in most other wells with shows in the same relative zone. The oil, green in color, was reported to be sulfur base crude.

On pump tests natural this week, the well recovered black water for several hours after which time oil started to show. Whether attempts would be made to complete at its present depth, about 4,100 ft., or whether deepening orders would be issued had not been determined. Original objective of this deeper horizon wildcat was the Richfield which is expected to be logged at about 5,000 ft.

The B-3 McCrandall is located on the northwest flank of the oil pool and appeared to be off the Dundee producing closure (Dundee was drilled out dry). Oil fill-up natural from this Detroit River pay was much better than the average oil show from Dundee wells in the pool.

The Billings field was opened by Socony in 1949, and the only other producing and developing company besides the discoverer is the Chapman Oil Co.

**MICHIGAN SUCCESSFUL WILDCAT**

Kent County, Algoma Township: McClanahan Oil Co. and W. S. Temples 1 Post, SW SW NE 35-9n-11w, Traverse 2,331 ft., 60 bbl. oil and 40 bbl. water, TD 2,342 ft.

**MICHIGAN WILDCAT FAILURES**

Allegan County, Clyde Township: Ford Oil Co. 1 Johnson, NW SW NW 32-2n-15w, Traverse 1,201 ft., dry, TD 1,211 ft.

Barry County, Hope Township: Norman L. Stevens 1 Flower, SW SE SW 17-2n-9w, Traverse 1,806 ft., dry, TD 1,860 ft.


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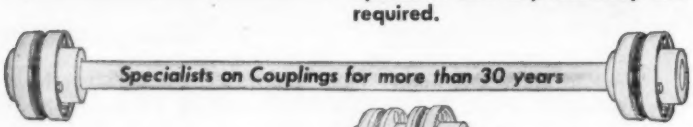


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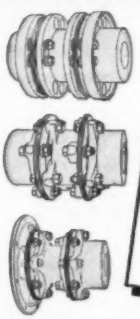

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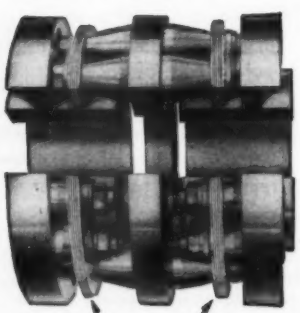

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# Louisiana-Arkansas

## Tensas Parish Test Finds Gas-Distillate

SHREVEPORT.—New gas-distillate production for Tensas Parish was assured at David M. Lide 1 State-Harris, 34-12n-12e, about 5 miles northwest of St. Joseph. A flowing test from the Tuscaloosa formation at 8,897-8,907 ft. gaged 65 bbl. of 53.6°-gravity distillate in 4 hours, through ⅛-in. tubing choke. Flowing tubing pressure was 2,600 psi. Operators estimated the open flow gas capacity at 50,000,000 cu. ft. daily. Gage on the gas flow on the 4-hour test was not reported.

The same operators have staked location for a second wildcat, 8 miles northeast of the new producer and 3 miles northeast of Newellton. It is to be the 1 Fred Outlaw, in 49-13n-12e.

The first commercial oil production in the big Logansport gas area of DeSoto Parish was reported at Skelly Oil Co. 1 Eliza Pyle, 5-12n-16w. The well flowed at the rate of 574 bbl. of oil a day, through ¼-in. choke, from the lower Pettit limestone to 6,445 ft., total depth. Gas-oil ratio was 411 cu. ft.

McAlester Fuel Co. was ready to start work at its Columbia County, Arkansas, wildcat ,which had been scheduled to drill to 6,700 ft. The new well is the 1-A H. H. Medlock, NE NW 7-16s-18w, about 5 miles east of production in the McNeil area.

C. H. Murphy 1 Emon, NW NE 20-18s-18w, Columbia County, was drilling ahead below 4,100 ft.

**NORTH LOUISIANA WILDCAT FAILURES**

Caddo Parish: W. E. Hall 1 Jacobs Land Co., 7-18n-15w, dry, TD 4,015 ft.

DeSoto Parish: Douglas Whitaker 1 E. Harris, approximately center 9-10n-13w, dry, TD 3,210 ft.

Franklin Parish: Petersen Drilling Co. 1 M. Senseman, SW SW 20-14n-7e, dry, TD 5,420 ft., elev. 80 ft., Paluxy 5,204 (?) ft.

Grant Parish: Clem S. Clarke 1 Edenborn est., NW NW 12-6n-3w, dry, TD 5,320 ft., elev. 171 ft., Cockfield 1,132 ft., Cook Mountain 1,850 ft., Sparta 2,043 ft., Cane River 2,643 ft., Talahatta 2,800 ft., Wilcox 2,930 ft.

Winn Parish: Pan American Production Co. 14 Tremont Lumber Co., SW SE SE 7-10n-1e, dry, TD 1,500 ft., elev. 122 ft., Wilcox 1,458 ft.

**ARKANSAS WILDCAT FAILURE**

Ouachita County: McAlester Fuel Co. 1-A Randall, SE SW 24-14s-19w, dry, TD 3,999 ft.



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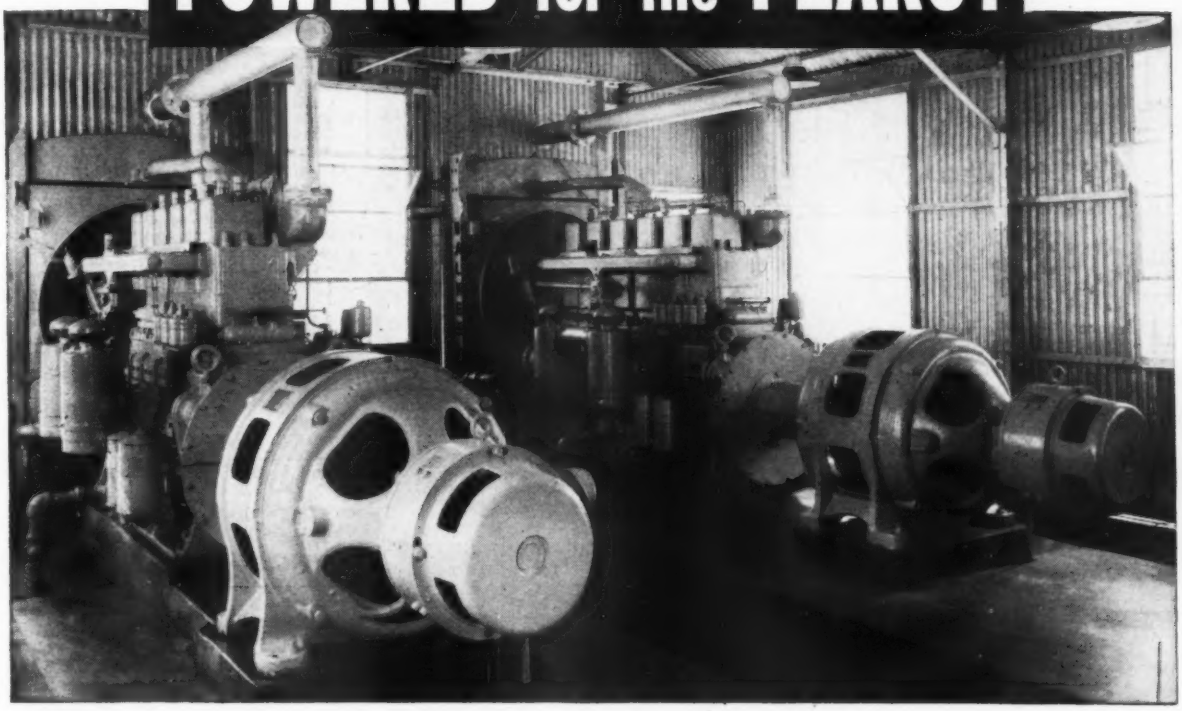

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## Canadian Fields

### Stettler Wildcat May Be Commercial Producer

CALGARY.—Natural gas in volume and crude oil in indicated commercial volume has been discovered by California-Standard Co. at its Stettler-Province No. 11-18 wildcat. Source of the gas and oil is the Lower Cretaceous sands. The well, located in LSD 11, 18-39-18w4, is 5 miles northeast of Stettler town, on the south central Alberta plains, and about 5 miles east of the Cretaceous oil pool opened by 1 Casagama last year. The Devonian oil field at Stettler is located about 9 miles to the southwest. Stettler is around 100 miles northeast of Calgary and about the same distance southeast of the Leduc oil area.

Cal-Standard reports four drill-stem tests on its Stettler wildcat, three giving large volumes of gas, the fourth and latest giving a rise of 29° to 30° A.P.I. gravity oil. All were 1-hour tests through ½-in. choke. First, interval 4,106 to 4,126 ft., gave maximum gas flow of 8,200,000 cu. ft. daily. Second, interval 4,117-37 ft., gave maximum gas flow 7,380,000 cu. ft. daily. Third, interval 4,145-59 ft., after penetrating a shale band, gave maximum 5,000,000 cu. ft. of gas daily. The fourth, interval 4,159-69 ft., gave only 400,000 cu. ft. gas flow rate, with pipe recovery 920 ft. of gassy crude oil. Coring is continuing.

On a seismograph feature, Cal-Standard's Stettler test will continue on to probe major objectives in the Devonian. Completion procedure will be determined by findings in the Devonian.

The Leduc area came through with an indicated D3 Devonian oil discovery on the southwest fringe of the D2 producing sector of the field this week, which will be fully evaluated by further follow-up drilling. The important well flowed oil from D3 after topping that horizon around 7 ft. below the water line of the main D3 Leduc-Woodbend oil zone. Nearest D3 producer is located about 2½ miles east-northeast of the indicated discovery. The well was carried 24 ft. into D3, but due to the small diameter of the hole, drilling was discontinued after a flow of oil was encountered. To fully determine the pay thickness of the indicated new structure, another well is planned.

The indicated discovery, P. D. No. 1, in LSD 11, 1-50-27w4, was drilled by Northern Development Co. an a quarter-section farmout from the team of British American Oil Co. and Leduc Leaseholds, Ltd.

The well is currently standing cemented with liner set in the oil zone. Cement plug will likely be drilled out within the next few days and production testing commenced shortly. During D3 drill-stem test from 5,411-5,420 ft. the well flowed oil to the surface in 200 minutes and pipe recovery was 2,100 ft. of clean oil. Total depth at the well is 5,420 ft.

**CANADIAN WILDCAT FAILURES**

Imperial-Lalby 1, LSD 1, 12-79-22w5, TD 7,849 ft.
Trans-Leduc 1, LSD 5, 31-56-19w4, TD 3,405 ft.
Sunderland-Warner 1, LSD 13, 20-4-16w4, TD 5,129 ft.
Falcon Seaboard-Seaboard Seminiuk 1, LSD 2, 28-59-19w4.


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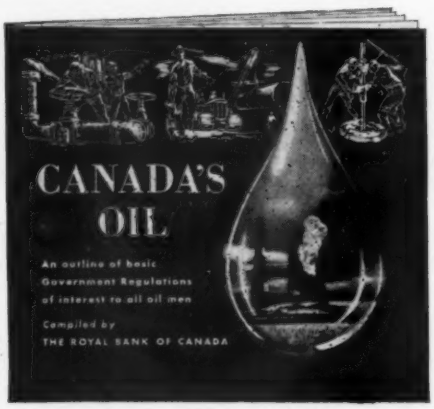


Maps of Western Canadian oil fields, showing locations of The Royal Bank branches are also contained in the book.

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## Illinois-Ind.-Ky.

### New Production Proved In Two Indiana Counties

TWO new pools were opened in Indiana during the week. H. C. Farmer proved the Heilman pool, northwest of the town of the same name in eastern Warrick County with the completion of his 1 Robinson, NE NW NW 20-4s-6w. N. W. Strange opened the Hardis Chapel pool, southern Knox County, with his 1 Holman Estate, SW SE SE 11-1n-9w. Each well pumped 15 bbl. of oil per day at completion, the former from McClosky lime at 1,290-93 ft., and the latter from the Rosiclare at 1,478-90 ft. ( total depth 1,539 ft.).

The Heilman discovery well is in wide open area more than 8 miles from nearest production, the Spurgeon pool, to the northwest in Pike County. At one time there was some small, shallow production in the Gentryville area, 4 miles to the southeast, but this has been abandoned. It is 9 miles northeast of Boonville. The Hardis Creek discovery is about 2 miles north of Union-Bowman production to the south in Pike County.

Perry Fulk 1 Coen, SE NW SE 3-3n-9e, 5 miles west of Olney, Richland County, Illinois, has established first Salem lime production in the Noble area of the Clay City-Noble Consolidated pool. Following a 2,000-gal. acid treatment in the Salem lime at 3,532-3,608 ft., the well flowed 730 bbl. of oil in the first 24 hours. Production settled to 14 bbl. per hour through ⅜-in. choke. Hole had been carried to Devonian lime, logged at 4,609-4,786 ft. The discovery is being confirmed by the same operator's 1 Miller, ½ mile to the southeast in the NW SE SW 2-3n-9e. The latter well, drilled to a total depth of 3,685 ft., swabbed 28 bbl. of oil per hour while testing a zone in the lower part of the Salem, where casing, cemented at 3,670 ft., first was perforated. Testing the upper Salem, with casing perforated at 3,602-10 ft., it swabbed 12 bbl. of oil per hour natural.

On the north side of the Burford pool, 4 miles east of Burford, Ohio County, west-

ern Kentucky, Day Brothers and associates have completed their 2 Daniel, 1-M-31, as the best producer so far completed in the the area. It pumped 80 bbl. of oil per day from Tar Springs sand at 715-44 ft. Total depth is 750 ft. with casing on top the pay zone.

J. C. Haynes and associates 2 Thompson, SE NE SW 2-1s-10w, in Militia Donation 101, Gibson County, Indiana, has extended production at the south end of the Union-Bowman pool to the west. Testing Aux Vases sand, a new pay zone for the area, at 1,721-36 ft., the well swabbed 116 bbl. of oil in the first hour. Production declined gradually to an average rate of about 25 bbl. per hour before the well was shut in for additional storage.

**ILLINOIS SUCCESSFUL WILDCAT**

Hamilton County: George & Wrather 1 Droit, SE SE SW 7-7s-5e, IP 430 bbl., lower O'Hara 3,197-3,200 ft., TD 3,393 ft. (Extension Cantrell pool.)

**ILLINOIS WILDCAT FAILURES**

Clark County: W. W. Dayton 1 Smith, SW NE NW 17-11n-10w, dry, TD 2,132 ft.
Clinton County: J. Dunnell et al., 1 Davis, SW SW SW 16-2n-2w, dry, TD 1,323 ft.
Crawford County: Alex Zanetis 1 Ellyes, NE SW SE 6-5n-10w, dry, TD 965 ft.
Edgar County: Carter Oil Co. 1 Busby, SW SW NW 5-16n-11w, dry, TD 1,850 ft.
Hamilton County: Ben Nation 1 Bell-Thompson, NW NW NW 18-4s-7e, dry, TD 3,495 ft.
Jasper County: W. A. Schuller 1 Blair, NE NE NW 23-5n-9e, dry, TD 3,082 ft.
Lawrence County: Wood & Edwards 1-A Hinton, NW SW NW 5-2n-12w, dry, TD 1,528 ft.
N. V. Duncan 1 Allison, SE SW NW 35-5n-11w, dry, TD 1,844 ft.
Madison County: Mazzorino & Neary 1 Unger, NE SW SW 22-4n-6w, dry, TD 1,895 ft.
Mason County: J. L. Pinkston 1 Blissman, SE SE NE 3-19n-10w, dry, TD 1,051 ft.
Montgomery County: Thomas S. Doran 1 Jones, SE SE SW 15-10n-1w, dry, TD 1,550 ft.
Shelby County: E. R. Jones 1 Price, SW NE NW 1-9n-1e, dry, TD 1,810 ft.
Wabash County: Hayes Drilling Co. and Big Four Oil & Gas Co. 1 Pixley, NE NE SW 24-1n-14w, dry, TD 2,323 ft.
Washington County: Dale Hopkins 1 Ergenroush, SW SW SW 22-2s-3w, dry, TD 1,370 ft.
Wayne County: Wayne Drilling Co. 1 Murphy et al., NW NE SW 25-1n-7e, dry, TD 3,208 ft.

**INDIANA SUCCESSFUL WILDCATS**

Gibson County: George & Wrather 1 Weber, NE NE NW 36-2s-10w, IP 96 bbl., Aux Vases lime 1,877-82 ft., TD 2,020 ft.
Knox County: N. W. Strange 1 W. Holman Est., SW SE SE 11-1n-9w, IP 15 bbl., Rosiclare 1,478-90 ft., TD 1,539 ft. (Opens Hardis Chapel pool.)
Warrick County: H. C. Farmer 1 Robinson, NE NW NW 20-4s-6w, IP 15 bbl., McClosky 1,290-93 ft., TD 1,293 ft.

**INDIANA WILDCAT FAILURES**

Daviess County: G. Cohen et al., 1 McKittrick, NW NW SE 6-4n-6w, dry, TD 1,215 ft.
Ryan & Sharp 1 Keith, SE NW SW SE Proj. 13-3n-7w, dry, TD 1,533 ft.
Ernest Zink 1 Kutch, NW SE NW 2-4n-5w, dry, TD 1,725 ft.
Gibson County: Barron Kidd 1 Dassel, SE NE NW 30-3s-9w, dry, TD 2,077 ft.
Homer Luttrell 1 Dewig, NW SE SW 30-3s-10w, dry, TD 2,285 ft.
Skiles Oil Corp. 1 Dyer-Boren Community, NE NW NW 17-3s-11w, dry, TD 2,133 ft.
Perry County: T. R. Lindsay 1 Hemfling, SW SW SW 21-5s-3w, dry, TD 708 ft.
Pike County: Illinois Mid-Continent Co. 1 Thomas, SE SW NW 12-2s-8w, dry, TD 1,538 ft.
Allen Cotton 1 State, SW SE SE 11-2s-7w, dry, TD 1,378 ft.
Posey County: Ryan & Sharp 1 Graulich, SW SW SE 33-6s-14w, dry, TD 2,950 ft.
Sullivan County: Ralph Halbert 1 Springer, NW NE SE 1-7n-10w, dry, TD 2,680 ft.
Warrick County: T. C. Mullins, Sr., 1 fee, NE NW SW 21-5s-8w, dry, TD 1,954 ft.

**WESTERN KENTUCKY WILDCAT FAILURES**

Daviess County: C. E. Skiles 1 Carico, NE SW SE 3-O-26, dry, TD 2,205 ft.
J. E. Newton 1 Evans, NW NE SW NW 11-O-31, dry, TD 1,297 ft.
Hancock County: C. C. White and G. A. Owens 1 Fuchs, SW SE NW NW 13-P-33, dry, TD 994 ft.
Henderson County: Yingling Oil & Mining


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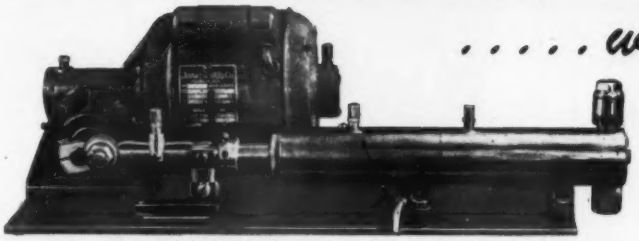
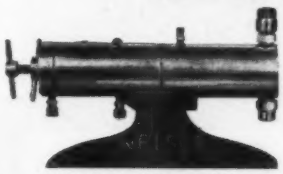
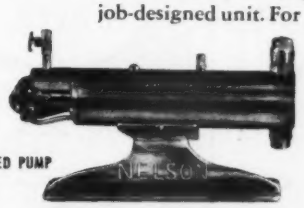


NELSON MOTORIZED DRIVE PUMP



NELSON SYNCHRONIZED DRIVE PUMP



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Co. 1 Letcher, SW NE SW NW 22-R-25, dry, TD 2,228 ft.

**EASTERN KENTUCKY**

ASHLAND.—In Pilot East pool along the Wolfe-Powell County line, Alfred Dodge, agent, has completed two field wells. The 18 J. B. White Heirs had top of Corniferous lime at 796 ft. and to total depth of 906 ft. had a well estimated at 30 bbl. oil per day. The 19 J. B. White Heirs had Corniferous at 846 ft. and was completed at 952 ft. with an initial potential of 25 bbl. of oil per day.

**EASTERN KENTUCKY WILDCAT FAILURE**

Knox County: Triangle Oil & Gas Co. 1 John W. Croley, Georges Branch of Stinking Creek, dry, TD 3,162 ft., Pencil Cave 2,300 ft., Big lime 2,313 ft., Devonian shale 2,833 ft., Corniferous 3,047 ft., shows of oil in Corniferous and Maxon sand.

# Permian Basin

## Ellenburger Discovery of Magnolia Being Tested

MIDLAND.—Flowing tests were started at Magnolia Petroleum Co. 2 Roy Parks, Section 10, M. Daugherty Survey, Ellenburger discovery 11⅓ miles southwest of Midland in Midland County.

Total depth was 12,970 ft., plugged back to 12,944 ft. where 5½-in. casing was set. After drilling plug, operators ran tubing and circulated with oil and water. The well kicked off without swabbing and flowed the load in 3 hours and 35 minutes through ¾-in. choke. The next hour it gaged 86.35 bbl. of new 54°-gravity oil, also through ¾-in. choke, with gas-oil ratio of 1,022 ft. Flowing tubing pressure was 450 psi. It was to continue testing, then complete.

On elevation of 3,835 ft., top of the Ellenburger was 12,955 ft. Top on the Pennsylvanian was 10,060 ft., and top on the Silurian was 12,260 ft.

In southern Terry County, commercial production from the Wolfcamp, lower Permian, was assured at Anderson-Prichard Oil Corp. 1 H. C. Bevers, NE NE 39-DD-John H. Gibson Survey, on the basis of two drill-stem tests. At last report the well had been drilled to 9,811 ft. and a third test was to be made.

Top on the Wolfcamp had not been reported. On elevation of 3,277 ft., top of the Sprayberry was 7,584 ft., and top on the Dean sand was 8,980 ft. A 3-hour test from 9,697-9,730 ft. produced a strong blow of air for 55 minutes, followed by a strong blow of gas. Recovery was 5,580 ft. of 41°-gravity oil, and operators estimated the hole to be filling at the rate of 24 bbl. of oil an hour as drill pipe unloaded while being pulled. A core from 9,731-61 ft., following the above test, recovered 28½ ft. of white lime, bleeding oil, then a 5-hour, 54-minute test from 9,697-9,761 ft. had gas in 20 minutes, mud in 1 hour, 50 minutes and oil 4 minutes later. Four hourly gages were: 21.7, 34.8, 30, and 34 bbl., for a total of 120.5 bbl. of 40.9°-gravity oil. There was no formation water with the oil. Recovery was reversed out.

Location on Anderson-Prichard's discovery is about 5 miles north of the south county line, and 13 miles from the west line.

Other Terry County exploration included Amerada Petroleum Corp. 1 N. W. Willard, NE NW 6-C37-PSL, a scheduled 12,000-ft. test about 1½ miles west of San Andres production in the Adair field, and just north of the south Terry County line. On elevation of 3,235 ft., tentative top on the Sprayberry was 7,270 ft., or about 240 ft. higher structurally than the same zone in Anderson-Prichard's 1 Bevers, some 6 miles to the northwest. It was also high to Stanolind Oil & Gas Co. 15 American Warehouse, deep test in Cedar Lake field of northeastern Gaines County. Drill-stem tests, if any, had not been reported for the 1 Willard. At last report it was drilling ahead in lime and sand below 7,481 ft.

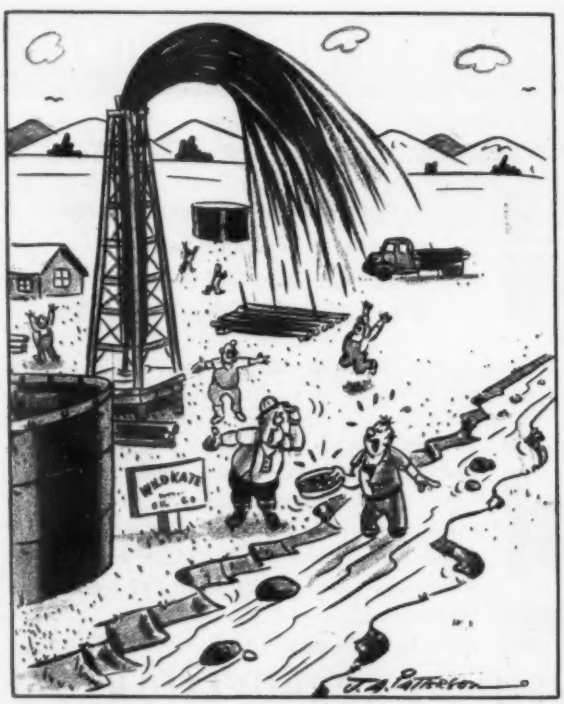
In the East Vealmoor field of Howard County, Barnsdall Oil Co. 3 W. L. Wilson, ½ mile south of its 1 Wilson, reef discovery, had prospects of a new pay for the area in a Pennsylvanian sand some 200 ft. above the expected reef top. Drill-stem test from 6,911-72 ft., open 1 hour and 40 minutes, had gas in 6 minutes, mud in 46 minutes, and oil in 50 minutes. During the first 25 minutes it flowed at the rate of 15 bbl. of oil an hour through 1-in. choke, then at the rate of 5 bbl. hourly through ¼-in. choke, into tanks. Gas-oil ratio was 900 cu. ft. and the oil was 39° gravity. Recovery in the pipe was 1,975 ft. of oil and 150 ft. of drilling fluid. Bottom-hole flowing pressure was 1,200 psi. and 30-minute shut-in pressure was 2,200 psi.

In southwestern Kent County, Kewanee Oil Co. completed its 1-C Wilson Connell as a Pennsylvanian discovery, tentatively identified as Strawn. Full details were not available on the 10-hour and 40-minute test, which gave the well a daily flowing potential of 313 bbl. of 28°-gravity oil, with gas-oil ratio of 394 cu. ft. Pay section was from 6,853-71 ft., which had been treated with 500 gal. of mud acid and 2,000 gal. of regular acid. The 1-C Connell is in the NW SE 3-4-H&GN, 3½ miles southwest of Barnsdall and Seaboard 1 L. R. Spires, Canyon discovery, and 4½ miles northwest of the Cogdell Canyon field.

**WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS**

Crockett County: Magnolia Petroleum Co. 1 Boyd Clayton, 1,320 ft. from S, 1,980 ft. from W lines, 12-GH-GC&SF, 10 mi. E Ozona, TD 9,076 ft., PB 8,750 ft., elev. 2,489 ft., Ellenburger 8,489 ft., perf. 8,630-65 ft., flowed 120 bbl. of 57°-gravity distillate, plus 9,275,000 cu. ft. of gas a day, 23/64-in. choke, CP 2,950 psi., TP 2,950-2,376 psi.

(Continued on page 120)

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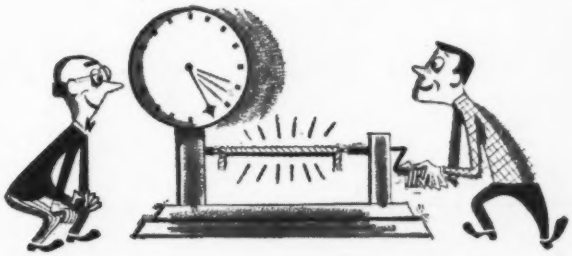

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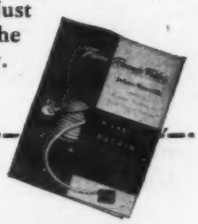

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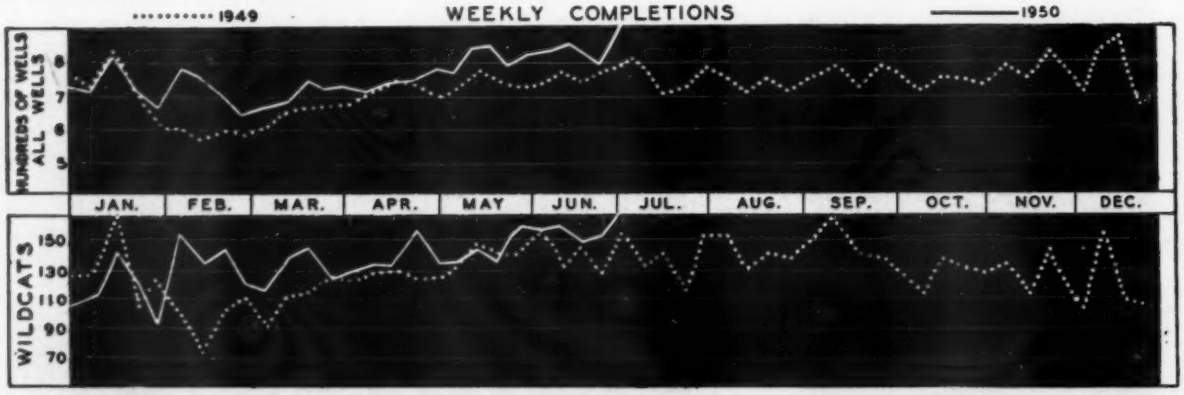
# CURRENT STATISTICS

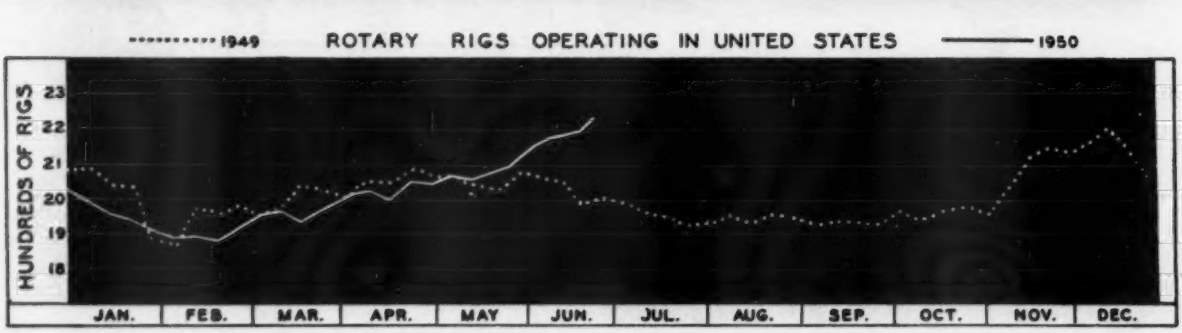
## EXPLORATION

### WEEKLY WELL COMPLETIONS . . . . WEEK ENDED JULY 1, 1950

| | Total of all wells | | | | | July 1 | | Wildcat completions and discoveries | | | | | Cumulative total, 1950 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Comp. | Oil | Gas | Dry | Footage | 1950 | 1949 | Oil | Dist. | Gas | Dry | Total | Oil | Dist. | Gas | Dry | Total |
| New York | 9 | 5 | 0 | *4 | 10,381 | 212 | 597 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennsylvania | 19 | 6 | 8 | *5 | 44,678 | 483 | 941 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| West Virginia | 9 | 1 | 7 | 1 | 23,977 | 314 | 245 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 12 | 22 |
| Ohio | 18 | 8 | 5 | 5 | 35,953 | 474 | 546 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 7 | 9 |
| Indiana | 45 | 21 | 0 | 24 | 71,089 | 685 | 615 | 3 | 0 | 0 | 12 | 15 | 19 | 0 | 1 | 131 | 151 |
| Kentucky | 29 | 12 | 2 | 15 | 47,984 | 472 | 436 | 0 | 0 | 0 | 5 | 5 | 10 | 0 | 1 | 40 | 51 |
| Illinois | 67 | 28 | 2 | 37 | 139,506 | 1,256 | 1,202 | 1 | 0 | 0 | 15 | 16 | 28 | 0 | 1 | 278 | 307 |
| Michigan | 19 | 10 | 1 | †8 | 41,337 | 392 | 469 | 1 | 0 | 0 | 2 | 3 | 18 | 0 | 4 | 123 | 145 |
| Kansas | 76 | 37 | 11 | 28 | 248,397 | 1,798 | 1,525 | 3 | 0 | 1 | 15 | 19 | 46 | 0 | 4 | 291 | 341 |
| Nebraska | 5 | 3 | 1 | 1 | 15,574 | 46 | 15 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 20 | 22 |
| Oklahoma | 127 | 90 | 3 | ‡34 | 493,810 | 2,610 | 2,116 | 4 | 0 | 1 | 9 | 14 | 81 | 5 | 9 | 325 | 420 |
| Texas | 357 | 234 | 13 | 110 | 1,649,136 | 7,808 | 6,780 | 11 | 3 | 4 | 59 | 77 | 236 | 19 | 63 | 1,243 | 1,561 |
| North Central (Dist. 7-B & 9) | 88 | 48 | 0 | 40 | 244,823 | 2,402 | 2,189 | 5 | 0 | 0 | 20 | 25 | 97 | 2 | 17 | 473 | 589 |
| West (Dist. 7-C & 8) | 113 | 93 | 1 | 19 | 688,387 | 2,251 | 1,610 | 1 | 1 | 1 | 13 | 16 | 49 | 2 | 2 | 245 | 298 |
| Panhandle (Dist. 10) | 16 | 10 | 4 | 2 | 53,980 | 465 | 507 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 11 | 14 |
| Eastern (Dist. 5, 6, & 6-P) | 35 | 23 | 0 | §12 | 118,986 | 592 | 444 | 0 | 0 | 0 | 1 | 1 | 8 | 3 | 1 | 104 | 116 |
| Gulf Coast (Dist. 2 & 3) | 48 | 28 | 3 | ‡17 | 296,213 | 1,093 | 995 | 2 | 1 | 1 | 11 | 15 | 39 | 7 | 22 | 169 | 237 |
| Southwest (Dist. 1 & 4) | 57 | 32 | 5 | 20 | 246,747 | 1,005 | 1,035 | 3 | 1 | 2 | 14 | 20 | 42 | 5 | 19 | 241 | 307 |
| Louisiana | 51 | 27 | 2 | 22 | 317,596 | 1,165 | 1,036 | 1 | 0 | 0 | 8 | 9 | 28 | 9 | 4 | 93 | 134 |
| Northern | 25 | 11 | 2 | 12 | 81,201 | 608 | 548 | 0 | 0 | 0 | 5 | 5 | 4 | 1 | 1 | 40 | 46 |
| Southern | 26 | 16 | 0 | 10 | 236,395 | 557 | 488 | 1 | 0 | 0 | 3 | 4 | 24 | 8 | 3 | 53 | 88 |
| Arkansas | 10 | 8 | 0 | 2 | 29,845 | 190 | 149 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 47 | 50 |
| Mississippi | 6 | 4 | 0 | 2 | 38,424 | 165 | 181 | 0 | 0 | 0 | 2 | 2 | 8 | 2 | 0 | 57 | 67 |
| Southeastern States | 2 | 1 | 0 | 1 | 11,136 | 32 | 22 | 1 | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 19 | 21 |
| Montana | 0 | 0 | 0 | 0 | 0 | 87 | 111 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 12 | 13 |
| Wyoming | 14 | 10 | 1 | 3 | 62,927 | 279 | 286 | 1 | 0 | 0 | 1 | 2 | 9 | 0 | 0 | 31 | 40 |
| Colorado-Utah | 1 | 0 | 0 | 1 | 4,020 | 31 | 57 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 23 | 23 |
| New Mexico | 8 | 5 | 1 | 2 | 35,511 | 310 | 280 | 0 | 0 | 0 | 1 | 1 | 10 | 1 | 0 | 26 | 37 |
| California | 39 | 25 | 0 | 14 | 159,892 | 854 | 1,352 | 1 | 0 | 0 | 10 | 11 | 12 | 0 | 2 | 172 | 186 |
| Miscellaneous | 0 | 0 | 0 | 0 | 0 | 8 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 |
| Total United States | 911 | 535 | 57 | 319 | 3,481,173 | 19,671 | 18,993 | 27 | 3 | 6 | 143 | 179 | 512 | 36 | 102 | 2,960 | 3,610 |
| Total previous week | 800 | 480 | 43 | 277 | 2,897,556 | .... | .... | 26 | 1 | 2 | 124 | 153 | 485 | 33 | 96 | 2,817 | 3,431 |
| Total July 1, 1949 | 820 | 452 | 57 | 311 | 3,046,971 | .... | .... | 28 | 1 | 4 | 124 | 157 | 454 | 48 | 91 | 2,707 | 3,300 |

Service wells included: *4, †2, ‡1, §6.



## DAILY AVERAGE PRODUCTION FOR WEEK

| | July 1 crude oil | B. of M. June demand | June 24 crude oil |
|---|---|---|---|
| Alabama | 1,800 | 1,800 | 1,850 |
| Arkansas | 79,550 | 87,000 | 79,700 |
| California | 873,500 | 850,000 | 871,500 |
| Colorado | 59,900 | 65,000 | 59,000 |
| Eastern | 62,400 | 62,000 | 63,150 |
| Florida | 1,500 | 1,200 | 1,700 |
| Illinois | 170,200 | 186,000 | 169,200 |
| Indiana | 29,700 | 28,000 | 29,800 |
| Kansas | 287,750 | 285,000 | 286,200 |
| Kentucky | 25,600 | 27,000 | 26,200 |
| Louisiana | 562,950 | 560,000 | 563,375 |
| North Louisiana | 118,150 | ..... | 118,650 |
| South Louisiana | 444,800 | ..... | 444,725 |
| Michigan | 44,300 | 46,000 | 44,600 |
| Mississippi | 110,650 | 103,000 | 111,150 |
| Montana | 22,100 | 25,000 | 22,800 |
| Nebraska | 2,100 | 3,000 | 2,100 |
| New Mexico | 127,525 | 144,000 | 126,675 |
| Oklahoma | 428,850 | 438,000 | 424,550 |
| Texas | 2,317,700 | 2,120,000 | 2,244,450 |
| Dist. 1 (Southwest) | 29,275 | ..... | 28,275 |
| Dist. 2 (Southwest) | 138,000 | ..... | 132,700 |
| Dist. 4 (Southwest) | 216,850 | ..... | 209,950 |
| Dist. 3 (Gulf Coast) | 392,050 | ..... | 403,500 |
| Dist. 5 (Eastern) | 35,875 | ..... | 33,925 |
| Dist. 6 (Eastern) | 92,875 | ..... | 88,575 |
| East Texas field | 276,350 | ..... | 282,000 |
| Dist. 7-C (West) | 57,100 | ..... | 53,275 |
| Dist. 8 (West) | 763,650 | ..... | 708,825 |
| Dist. 7-B (W. Central) | 71,700 | ..... | 69,325 |
| Dist. 9 (N. Central) | 151,500 | ..... | 141,850 |
| Dist. 10 (Panhandle) | 92,475 | ..... | 92,250 |
| Utah | 3,500 | 4,000 | 3,500 |
| Wyoming | 158,200 | 154,000 | 159,500 |
| Total United States | *5,369,775 | 5,190,000 | 5,291,000 |
| Change from previous week, up | 78,775 | | |
| Canada | 71,520 | ..... | 71,310 |

Total U. S. production January 1-July 1 ..... †922,111,190 bbl.
Same period last year (crude plus cond.) ..... 947,897,510 bbl.

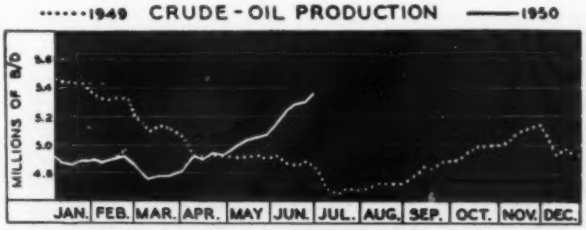
*Not incl. 97,595 bbl. condensate. †Incl. 17,734,290 bbl. condensate.

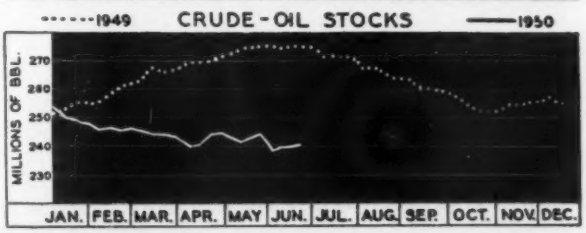
## CRUDE-OIL STOCKS BY STATES OF ORIGIN*

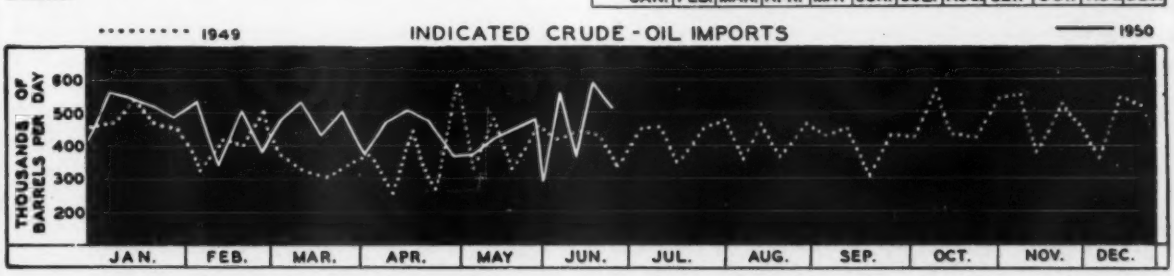
(Thousands of barrels)

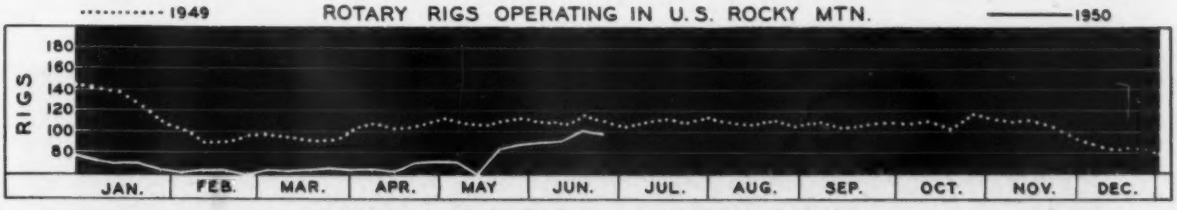
| | June 24, 1950 | June 17, 1950 | June 25, 1949 |
|---|---|---|---|
| Pennsylvania Grade | 2,878 | 2,916 | 2,954 |
| Other Appalachian | 1,684 | 1,582 | 2,101 |
| Illinois, Indiana, Michigan | 9,100 | 9,400 | 14,384 |
| Arkansas | 3,093 | 2,777 | 2,926 |
| Louisiana | 15,635 | 15,332 | 15,076 |
| North | 3,736 | 3,362 | 3,288 |
| Gulf | 11,899 | 11,970 | 11,788 |
| Mississippi | 2,225 | 2,326 | 3,318 |
| New Mexico | 5,672 | 6,073 | 7,634 |
| Oklahoma and Kansas | 33,787 | 33,955 | 40,492 |
| Texas | 112,344 | 110,683 | 128,674 |
| East Texas | 15,801 | 15,749 | 17,505 |
| West Texas | 41,255 | 40,427 | 51,439 |
| Texas Gulf | 27,361 | 26,738 | 30,037 |
| Other Texas | 27,927 | 27,769 | 29,693 |
| Rocky Mountain | 12,533 | 12,550 | 14,078 |
| California | 35,149 | 35,492 | 34,619 |
| Foreign | 6,662 | 6,776 | 7,858 |
| Total | 240,762 | 239,862 | 274,114 |

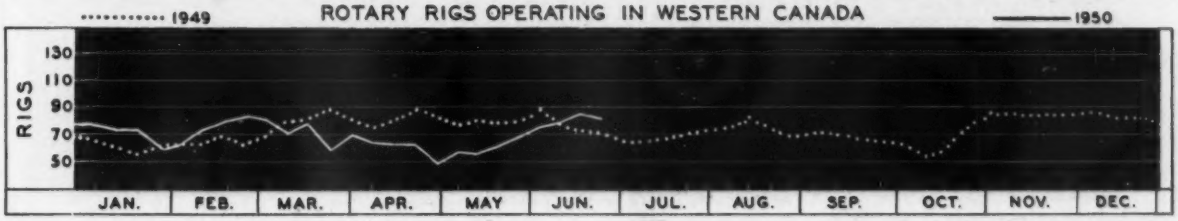
*Bureau of Mines.





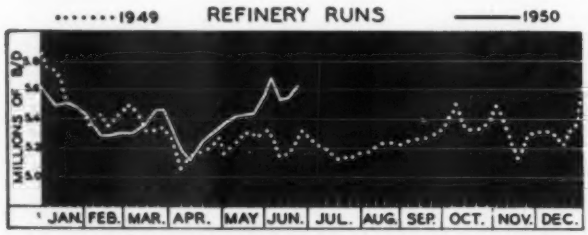

XUM

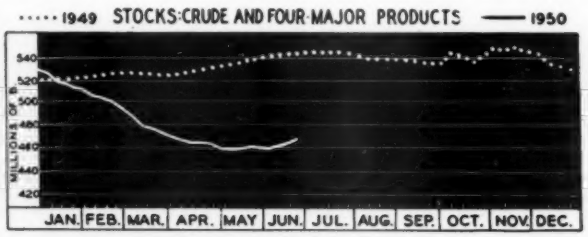
## A.P.I. REFINERY REPORT, JUNE 24

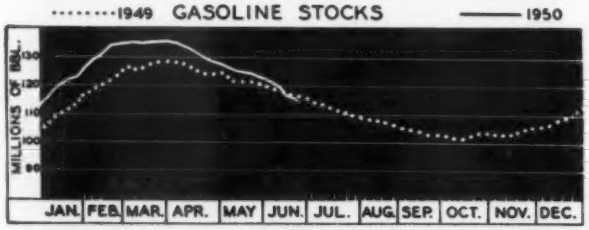
(Thousands of barrels)

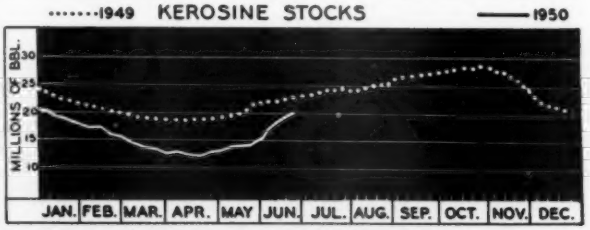
| District— | Daily avg. crude runs | Daily average production: Gasoline* | Kerosine | Distillate | Residual | Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline† | Kerosine | Distillate | Residual | Bureau of Mines, June 1949: Daily avg. crude runs | Daily average production: Gasoline* | Kerosine | Distillate | Residual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East Coast | 941 | 407.3 | 35.0 | 183.9 | 173.7 | 25,873 | 6,996 | 12,866 | 10,618 | 694 | 285.9 | 24.3 | 114.0 | 143.9 |
| Appalachian: | | | | | | | | | | | | | | |
| District 1 | 85 | 39.2 | 2.9 | 11.0 | 8.1 | 2,392 | 363 | 610 | 341 | 90 | 42.8 | 3.1 | 8.5 | 6.3 |
| District 2 | 72 | 31.1 | 5.4 | 7.9 | 14.3 | 940 | 118 | 208 | 169 | 58 | 29.9 | 1.8 | 4.7 | 10.7 |
| Ind., Ill., Ky. | 1,030 | 554.4 | 67.0 | 141.0 | 129.3 | 23,056 | 3,742 | 7,669 | 3,208 | 865 | 487.6 | 40.8 | 103.3 | 121.3 |
| Okla., Kans., Mo. | 498 | 267.4 | 10.9 | 111.3 | 59.4 | 12,103 | 1,069 | 4,653 | 1,174 | 423 | 236.1 | 18.8 | 81.3 | 57.2 |
| Inland Texas | 220 | 155.4 | 11.1 | 25.0 | 43.1 | 3,378 | 442 | 1,061 | 728 | 217 | 161.5 | 11.6 | 19.2 | 45.6 |
| Texas Gulf Coast | 1,167 | 580.0 | 86.3 | 239.4 | 216.9 | 17,085 | 3,084 | 7,617 | 4,540 | 1,236 | 647.8 | 68.5 | 170.1 | 224.9 |
| La. Gulf Coast | 474 | 234.2 | 48.3 | 103.1 | 67.9 | 5,521 | 2,680 | 3,145 | 1,980 | 401 | 215.5 | 29.9 | 94.0 | 41.8 |
| N. La. and Ark. | 58 | 25.1 | 5.0 | 13.1 | 11.3 | 2,588 | 460 | 495 | 221 | 76 | 32.8 | 6.2 | 11.9 | 15.9 |
| Rocky Mountain: | | | | | | | | | | | | | | |
| New Mexico | 14 | 7.6 | .4 | 1.9 | 2.9 | 107 | 25 | 55 | 37 | 11 | 5.8 | 0.3 | 1.8 | 2.7 |
| Other Rocky Mtn. | 185 | 87.4 | 7.3 | 32.4 | 32.9 | 4,738 | 358 | 1,277 | 592 | 170 | 77.1 | 4.7 | 30.2 | 31.3 |
| California | 892 | 414.6 | 6.3 | 111.1 | 306.1 | 17,255 | 828 | 10,924 | 17,683 | 921 | 373.8 | 13.8 | 132.2 | 339.0 |
| June 24, 1950 | 5,636 | 2,803.7 | 285.9 | 981.1 | 1,065.9 | 115,036 | 20,165 | 50,580 | 41,291 | 5,162 | 2,596.6 | 223.8 | 771.2 | 1,040.6 |
| June 17, 1950 | 5,565 | 2,719.1 | 290.4 | 1,009.3 | 1,066.7 | 116,374 | 19,507 | 47,717 | 40,740 | ..... | ..... | ..... | ..... | ..... |
| June 25, 1949 | 5,322 | 2,637.4 | 236.9 | 735.4 | 1,122.3 | 115,715 | 23,313 | 63,409 | 66,146 | ..... | ..... | ..... | ..... | ..... |

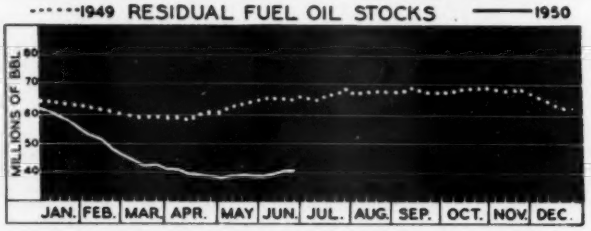
*At refineries including natural blended. †Finished and unfinished.

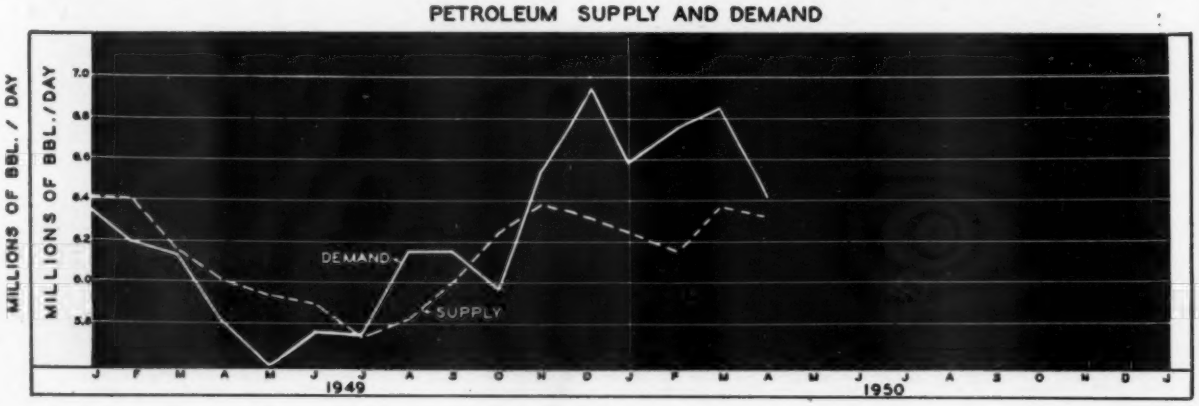




## CRUDE PRICES

### GRAVITY SCHEDULE

| Gravity— | Signal Hill, Calif. | Okla-homa, Kansas | Gulf Coast Tex.* | West Tex.† |
|---|---|---|---|---|
| 18-18.9 | $1.63 | .... | .... | .... |
| 19-19.9 | 1.72 | .... | .... | .... |
| 20-20.9 | 1.80 | $2.25 | .... | $2.12 |
| 21-21.9 | 1.89 | 2.27 | .... | 2.14 |
| 22-22.9 | 1.97 | 2.29 | .... | 2.16 |
| 23-23.9 | 20.6 | 2.31 | .... | 2.18 |
| 24-24.9 | 2.14 | 2.33 | $2.56 | 2.20 |
| 25-25.9 | 2.23 | 2.35 | 2.58 | 2.22 |
| 26-26.9 | 2.31 | 2.37 | 2.60 | 2.24 |
| 27-27.9 | 2.37 | 2.39 | 2.62 | 2.26 |
| 28-28.9 | 2.42 | 2.41 | 2.64 | 2.28 |
| 29-29.9 | 2.48 | 2.43 | 2.66 | 2.30 |
| 30-30.9 | 2.54 | 2.45 | 2.68 | 2.32 |
| 31-31.9 | 2.59 | 2.47 | 2.70 | 2.34 |
| 32-32.9 | 2.64 | 2.49 | 2.72 | 2.36 |
| 33-33.9 | .... | 2.51 | 2.74 | 2.38 |
| 34-34.9 | .... | 2.53 | 2.76 | 2.40 |
| 35-35.9 | .... | 2.55 | 2.78 | 2.42 |
| 36-36.9 | .... | 2.57 | 2.80 | 2.44 |
| 37-37.9 | .... | 2.59 | 2.82 | 2.46 |
| 38-38.9 | .... | 2.61 | 2.84 | 2.48 |
| 39-39.9 | .... | 2.63 | 2.86 | 2.50 |
| 40 and above | .... | 2.65 | 2.88 | 2.52 |

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

## FLAT CRUDE PRICES

Representative posted schedules per barrel.

| | |
|---|---|
| East Texas† | $2.65 |
| Kettleman Hills, California* | 2.77 |
| Beauregard Parish | 2.60 |
| Illinois Basin | 2.77 |
| Pecos County, Texas (Yates) | 2.35 |
| Bradford, Pennsylvania | 3.75 |
| Eastern Ill. and Western Ind.† | 2.77 |
| Tomball, Texas Gulf Coast | 2.83 |

*37°-37.9°. †35° and above.

GASOLINE prices on the Gulf Coast advanced .25 cent a gallon on formal quotations following a period in which most of the open-market movement has been at the higher price. The new posting on 83-octane regular for cargo shipments is 10.75 cents a gallon on the low, and on 90-octane premium, the low quotation is now 11.5 cents.

The New York Harbor barge price for gasoline is unchanged, and some suppliers believe that the effect of the tight condition of the Gulf Coast gasoline market was reflected in part in the harbor increase of .25 cent a gallon which came about middle of June.

The same high demand for gasoline which resulted in the Gulf Coast price increase has strengthened the natural-gasoline market. Group 3 quotations for 26-70 natural moved up .25 cent a gallon to 5.375 cents. However, natural is still .125 cent under postings for this time last year, while regular gasoline is up a strong .5 cent.

Standard Oil Co. of California announced increases in prices posted for heavy crudes, ranging from 15 cents a barrel for 14° gravity to no change for 26° gravity and lighter crudes. This increase, which partially restores previous cuts for fuel-producing crudes, has been met by other crude purchasers in the area.

At the same time, Standard announced an increase of 15 cents a barrel in its selling price for residual fuels. This brings the cargo price at Los Angeles to $1.40 a barrel. Any surplus residual, shipped to the East Coast, would have to move at a lower base price to compete with $2.05 fuel in New York Harbor.

In the Group 3 area, railroad purchases of heavy fuel for July are reported at $1.60 a barrel, down 5 cents from June. Excess material at a few refineries, caused by reduced railroad purchases, has been moved.

## REPRESENTATIVE QUOTATIONS

Representative spot-market quotation of leading suppliers as of July 3, 1950. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

### GASOLINE, KEROSINE, AND FUEL OILS

| | Mid-Continent Group 3 | New York Harbor (barge) | Texas Gulf Coast |
|---|---|---|---|
| Regular gasoline, 80-82 octane | 10⅛-10½ | 12.25 | 10¾-11¼ |
| Premium gasoline, 86-88 octane | 10¾-11½ | 13.25 | 11½-12 |
| 42-44 w.w. kerosine | 8¼-8½ | 8.9-9.1 | 8-8½ |
| No. 2 straw fuel oil | 7⅜-7⅝ | 7.6-8.0 | 7-7¼ |
| No. 6 residual | $1.60-1.70 | $2.05 | $1.65-1.80 |

### NATURAL GASOLINE

| | Group 3 | North Texas | N. La. |
|---|---|---|---|
| Grade 26-70 | 5⅜ | 4⅞ | 5⅛ |
| Grade 18-55 | 6.45 | 5.95 | 6.2 |

### LUBRICATING OILS

**South Texas**

| | |
|---|---|
| 200 vis., No. 2-3 neutral | 11.5 |
| 750 vis., No. 3-4 neutral | 13.75 |
| 2,000 No. 5-6 neutral | 15.5 |

### LUBRICATING OILS

**Mid-Continent**

| | |
|---|---|
| 150-160 vis., D bright stock, 0-10 pp. | 18.5-19 |
| 200 vis., No. 3 neutral, 0-10 pp. | 12.5 |

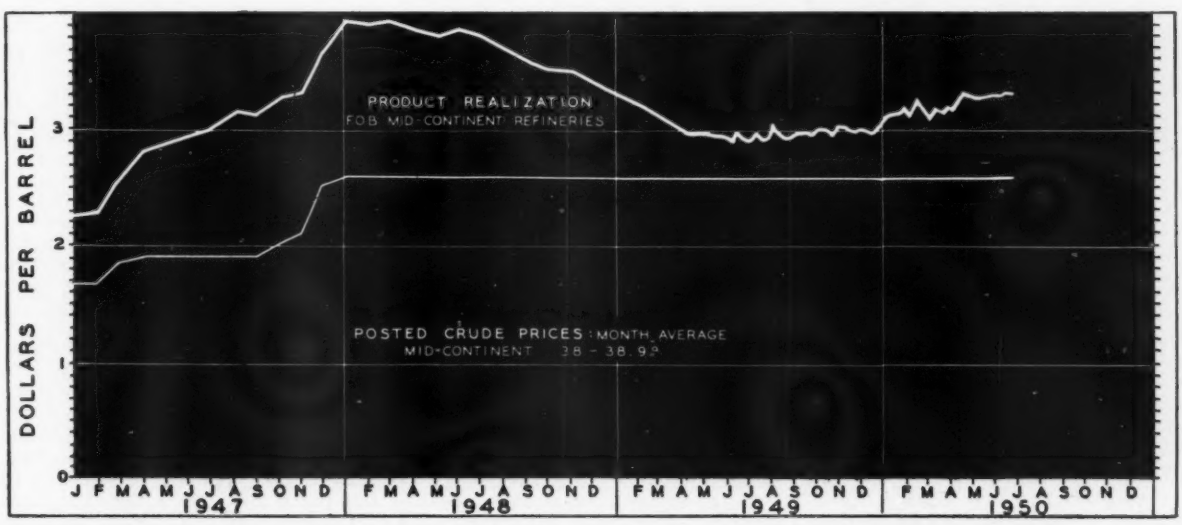
**Western Pennsylvania**

| | |
|---|---|
| 145-155 vis., 10 p.t. bright stock | 20.5-21 |
| 180 vis., 0 p.t. neutral | 21.5-22 |

### WAX

**Mid-Continent**

| | |
|---|---|
| 132-134 A.M.P. | 4.50 |


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
DOLLARS PER BARREL
0
1
2
3
J F M A M J J A S O N D
1947
F M A M J J A S O N D
1948
F M A M J J A S O N D
1949
F M A M J J A S O N D
1950

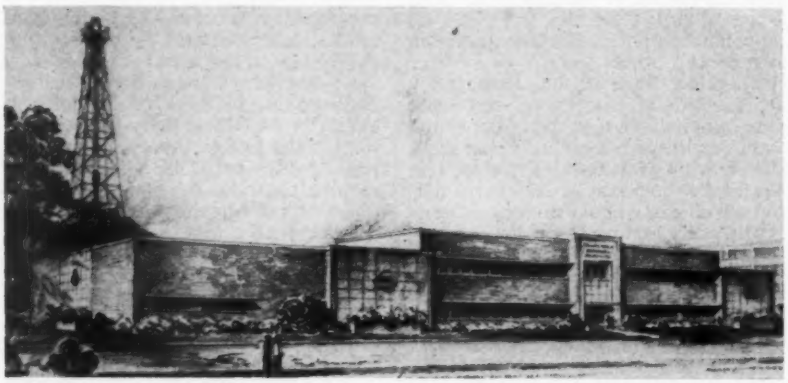
*In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.33 for week ended June 24, $3.34 for previous week, and $2.97 for June 1949.*



XUM

# EQUIPMENT MEN . . . in the News

## Hughes Announces New Board Members, Engineering Lab



*Architect's drawing of the proposed $2,000,000 Hughes Tool Co. engineering laboratories to be constructed in Houston immediately.*

Election of M. E. (Monty) Montrose, vice president in charge of sales; Daniel J. Martin, vice president in

*M. E. MONTROSE*

charge of engineering; and Thomas A. Slack, vice president and general counsel, to the board of directors of Hughes Tool Co., has been announced by Fred W. Ayers, senior vice president and general manager of the company. Addition of these top executives to the board of directors brings closer coordination of commercial and engineering projects being undertaken in the specialized oil-well drilling equipment field throughout the world.

Ayers also has announced the completion of plans for the erection of the new $2,000,000 Hughes Tool engineering laboratories at Houston. The new laboratories will be a division of the metallurgical department, which is one of the three engineering departments under Daniel J. Martin. The new building is scheduled for completion by June 1951.

## Pelton Water Wheel Promotes C. J. Woodard

*C. J. WOODARD*

In a recent announcement by W. F. Boyle, vice president of Pelton Water Wheel Co. in San Francisco, C. J. Woodard, formerly in charge of sales and service of the long-stroke hydraulic pumping-jack division, has been made manager of the oil-industry machinery division. Headquarters of this division are in Los Angeles.

Woodard joined Pelton as an engineer in the hydraulic turbine and valve division. He was later assigned to the development and marketing of long stroke hydraulic pumping equipment.

## Wigg to Represent Powell In Pacific Northwest

Robert J. Wigg has been appointed sales and service representative for Wm. Powell Co., valve manufacturers, Cincinnati, according to an announcement from H. E. Coombe, president.

Wigg, whose headquarters are at Portland, Ore., will call upon the trade in Oregon, Washington, and Idaho, heretofore covered by Charles M. Keyser.

## Rieke Made Schlumberger General Sales Manager

*R. R. RIEKE*

R. R. Rieke, former manager of the Gulf Coast area for Schlumberger Well Surveying Corp., has been named to the newly created position of general sales manager for Schlumberger, R. Henquet, executive vice president, has announced. Rieke has moved his office to Schlumberger headquarters in Houston.

E. F. Stratton, former Rocky Mountain area manager, has been moved to Houston to take over a new assignment. In his new position, Stratton will have charge of two former areas which have been combined to form Schlumberger's Southwest area. The area will include all operations in the Texas Gulf Coast and Southwest Texas.

Immediately after he graduated from University of Iowa in 1936, Rieke joined the Schlumberger organization as field engineer and worked in Pennsylvania and Canada. Then he was district manager in Wharton, Tex., before he was named manager of the Gulf Coast area in 1943.

## Bartolero Rejoins Byron Jackson Pump Division

*C. BARTOLERO*

Carlos Bartolero has been appointed to the position of project sales engineer of the pump division, Byron Jackson Co., according to an announcement by Lynn Sawyer, vice president of the company and manager of the pump division. Bartolero will make his headquarters in Los Angeles, but will spend most of his time in the field. His work will primarily be concerned with problems of pumping in the petroleum-processing industries and in the pipe-line field.

Bartolero was associated with the Byron Jackson Co. for 8 years, from 1928 to 1936, and has been active in the pump field since that time. He graduated from University of California in 1928 with a B.S. degree in mechanical engineering.

*(Continued on page 119)*

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UNDISPLAYED CLASSIFIED 12c a word one issue. 10% Discount three or more issues. $3.00 minimum charge. Blind Box in our care counts nine words. Payable in Advance.

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$12.00 a column inch one issue . . .
10% Discount three or more issues.

## EQUIPMENT FOR SALE

7500′ of 2½″ Range 2 Upset Seamless Tubing. Call or write Edco Pipe & Supply Co., Box 565, Drumright, Oklahoma, Phone 933.

**FOR SALE:** New 1¼″ Improved plow steel wire lines 6 x 19 R L Hemp Core. One Spool 3500′ at 28c per ft. Four Spools 1800′ at 24c per ft. Thirty Spools 600′ at 20c per ft. FOB Okla. City, Okla. General Tool & Supply Co. P.O. Box 4387—1319 S.E. 29th. St., Okla. City, Okla.

FOR SALE—10,000 new J-55—8 round thread couplings. Will sell any amount at $1.65 each loaded in railroad car. Stanford Engineering Company, Salem, Illinois. Phone 552.

**FOR SALE:** One 7¼ x 14 FXK Gardner Denver power pump in first class condition. Late model pump with all new improvements. S. E. Frogge Equipment Company, Box 4455, Oklahoma City, Oklahoma, Phone 6-5518, Residence 2401 Moore.

1—Shot Hole Drill Truck, Chassis WHAX 1947 Dodge, Mayhew Drilling Unit—Model 600 Complete w/ Gardner-Denver 4½x5 mud pump. Mast 19 feet—Kelly 12½ feet. 100 feet 2¾″ Used Drill Rod. 3—Dodge Water Trucks: 2 Ton Chassis WHAX—2 Ton, 400 Gallon Tank, Tulsa 18—Winch. 1—Model DDH—Oliver Cletrac Tractor w/ Hercules 6 cylinder Diesel Engine, Electric Starter and battery ignition complete with southwest cable controlled trailbuilder and Buckeye Double Drum Power Control Unit. If interested, write or call The Atlantic Refining Company, c/o Mr. V. H. Gray, P. O Box 2819, Dallas, Texas, Telephone P7-6484. Station 8-273, Dallas.

## Used Wood Tanks For Water-Flooding

5—vertical cypress tanks closed, 10′ dia. on bottom, 9′ dia. on top, 8′ high, 2¼″ staves, have manholes.
18—vertical cypress tanks, open top, 8′ dia. on bottom, 7′ 6″ dia. on top, 6′ high, 2¼″ staves
6—vertical oak tanks, closed, 7′ 4″ dia. on bottom, 6′ dia. on top, 8′ high, 2½″ staves, have manholes
10—vertical cypress tanks, closed, 9′ 6″ dia. on bottom, 8′ 6″ dia. on top, 7′ 6″ high, 2¼″ staves, have manholes
7—vertical cypress tanks, closed, 11′ dia. on bottom, 10′ dia. on top, 8′ 6″ high, 2¼″ staves, have manholes
28—vertical cypress tanks, closed, 10′ dia on bottom, 9′ dia. on top, 17′ 4″ high, 2¼″ staves, have manholes
2—vertical redwood tanks, open top, 17′ dia. by 17′ high, 3″ staves
All tanks complete with round hoops and lugs.

These tanks were used for beer storage and are in
**FIRST CLASS CONDITION**

*Other sizes also available. Please write for complete specifications and prices.*

• • • • • •

**New and Guaranteed Used STEEL TANKS**

Bolted Type up to 10,000 barrel. Welded and Riveted up to 74,000 barrel.

*Your inquiry will be appreciated.*

**A. GREENSPON PIPE CO., INC.**
**3615 Olive St., St. Louis 8, Mo.**

## EQUIPMENT FOR SALE

**FOR CABLE TOOLS**
**DEGEN PIPE AND SUPPLY CO.**
**Box 107, Red Fork Station, Tulsa, Oklahoma**

COOPER Single Drum Winch Tractor, Model W-201-26, with 45-foot mast, A-1 condition. $2250.00. Rogers Pipe & Supply Co., Tulsa, Phone 3-2072.

**FOR SALE**

BOILERS. Combustion Engineering, VU Type, 600#, 750° FTT 140,000# steam evaporation per hr. NEW, Never Erected. Immediate Delivery. 2—B&W, 450# psig. 700° FTT, 50,000# evaporation per hr. NEW. 2—B & W Bent Tube, 300#, 100,000# evap. per hr. NEW. All in storage. Inspections by appointment. Low Prices. Investigate. Drawings on request. CHARLES WEAVER, 4145 Penobscot Bldg., Detroit 26, Michigan. Send for Boiler Bulletin No. 320.

Several Army Surplus 4½″ x 6″ Gaso Duplex 1860 Pumps — two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

**H. H. COFFIELD**
**ATTN: W. H. Orr**
**Phones: 132—Rockdale, Texas**
**A-86064—Houston, Texas**

## EQUIPMENT FOR SALE

**CULVER Vertical Furnaces for exfoliating Perlite $10,000 compared to $100,000 for old style, also purest of Perlite for sale. Particulars Box 2153-OJ, Denver, Colo.**

NATIONAL "50" Compound Double Drum Rig 126′ Cantilever L. C. Moore Mast. 10′ substructure. 6,000′ 4½″ drill pipe. This rig complete and in excellent condition. P. O. Box 205, Sta. B, Bakersfield, California.

WILSON Mogul Draw Works Unit with compound powered by International UD-18 Motor complete with 55-foot double telescoping mast ready to use. Two Traveling Blocks and Hooks, Rotary, 4-foot Substructure. All in good condition. Real Bargain at only $6000.00. Contact D. C. Bonnet Trucking Co., New Iberia, La.

**THE INTERSTATE PIPE & SUPPLY COMPANY**
**Marietta, Ohio**
**P.O. Box 548 . . . Phone 2468**

**First Class Used Casing—Lapweld—Low Prices**
**10¾″ O.D.—8⅝″ O.D.—7″ O.D.—5½″ O.D. 2″ 4½# tubing, both regular and upset.**

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### VERTICAL STORAGE TANKS

1—55,000-Bbl. Riveted Steel Tank
1—38,000-Bbl. Riveted Steel Tank
2—15,000-Bbl. Riveted Steel Tank
6—10,000-Bbl. Riveted Steel Tank
4— 5,000-Bbl. Riveted Steel Tank
2— 4,500-Bbl. Riveted Steel Tank
9— 3,700-Bbl. Riveted Steel Tank
2— 3,100-Bbl. Riveted Steel Tank
2— 2,600-Bbl. Riveted Steel Tank
5— 1,900-Bbl. Riveted Steel Tank
3— 1,600-Bbl. Riveted Steel Tank
1— 1,500-Bbl. Riveted Steel Tank
4— 1,000-Bbl. Riveted Steel Tank
2— 350-Bbl. Riveted Steel Tank
1— 300-Bbl. Riveted Steel Tank
2— 746-Bbl. Spheroid Steel Tank

### HORIZONTAL STORAGE TANKS

2—8-0 x 36-0 x 3/8″; 14,000 gallon; 101 P.S.I.W.P.; Riveted & Welded
3—8-0 x 20-0 x 3/8″; 7,500 gallon; Tanks
6—6-0 x 24-0 x 3/8″; 4,250 gallon; Tanks
2—7-6 x 26-0 x 1/2″; 9,250 gallon; Tanks
3—6-0 x 25-4 x 1/2″; 5,400 gallon; Tanks
3—7-0 x 32-6 x 1/2″; 9,350 gallon; Tanks
9—9-0 x 23-6 x 1/4″; 12,000 gallon; Tanks
1—7-0 x 30-0 x 7/16″; 8,000 gallon; Tanks

1—Bubble Tower, flash tower for Cracker. Upper part Stainless Steel lined. 10-0 x 39-9 x 1 3/8″ thick x 1″ heads. 3 trays; 63 C.I. bubble caps/tray. 3 baffle plates 75 psi. @ 750 F.; riveted construction.
1—Fractionating Tower for Cracker. 10-0 x 52-6 x 1 3/8″ thick x 1″ heads. 16 trays; 63 C.I. bubble caps/trays; 75 psi. @ 750 F.; riveted construction.
1—Gasoline Weathering Tower; 3-6 x 50-0 x ½″ thick; 200 psi. test; 2-4 x 10-0 condenser on top; 4 trays with 16″ spacing.
1—Dephlegmator; 5-0 x 21-6 x 5/16″ thick; 100 psi. test; 5 trays, 20″ spacing.
1—Evaporator; 7-6 x 21-6 x 5/16″ thick; 100 psi. test; 4 trays, 20″ spacing.
1—Braun Vacuum Tower; 5-0 x 44-7 x 3/8″ thick; 11 trays; manway each tray.
1—Absorber; 5-0 x 30-0 x 3/8″ thick; 120 psi. test, w/Tulsa type mist extractor; 10 trays; 20″ spacing.
1—Absorber; 6-0 x 28-0 x 3/8″ thick; 30 psi. test; 16 trays, spacing 16″.
3—10-0 x 30-0 x ½″ thick; 18,000 gallon capacity. One double compartmented. Riveted construction.
1—Reactor for Cracker; 3-0 x 32-0 x 4″ thick; approximately 1″ concrete lining. Forged construction.
1—Reactor; 10-0 x 32-0 x 1¾″ thick x 7/8″ head. Welded construction.
2—9-0 x 33-0 x 1 1/8″; riveted construction.
1—9-2⅞″ x 39-1 x 1 7/16″ thick; 1—36″ manway and 1—16″ manway.

**MANY OTHER ITEMS TOO NUMEROUS TO LIST. WRITE FOR BOOKLET, OR ARRANGE FOR PERSONAL INSPECTION.**



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## $100,000.00 STOCK OF PUMPS AT BARGAIN PRICES

### CENTRIFUGAL PUMPS

2—Rex single stage, 7000 g.p.h., driven by one cylinder Wisconsin gasoline engine, mounted on rubber tired wheels.

2—B-J, Type H-SM, single stage, 165 g.p.m. @ 170′ head, direct connected to 10 hp, G.E., 220/440 v, 3 ph, 60 cy. induction motor.

2—B-J, Type H-SM, single stage, 125 g.p.m. @ 355′ head, direct connected to 20 hp, 220/440 v, 3 ph, 60 cy. totally enclosed, fan cooled motor.

2—B-J, Type H-SM, single stage, 800 g.p.m. @ 625′ head, direct connected to 125 hp, 3 ph, 60 cy, 440 v, totally enclosed, fan cooled motor.

2—B-J, Type H-SM, single stage, 125 g.p.m. @ 228′ head, direct connected to 10 hp, 220/440 v, 3 ph. 60 cy. totally enclosed, fan cooled motor.

2—B-J, Type 6STGMX, 6 stage, 250 g.p.m. @ 1300′ head, direct connected to 75 hp, 220/440 v, 3 ph, 60 cy, totally enclosed, fan cooled motor.

1—B-J, Type BM, single stage, 350 g.p.m. @ 150′ head, direct connected to 20 hp, 220/440 v, 3 ph, 60 cy, totally enclosed, fan cooled motor.

2—B-J, H-SM, single stage, 350 g.p.m. @ 227′ head, direct connected to 25 hp, 220/440 v, 3 ph, 60 cy. totally enclosed fan cooled motor.

1—B-J, Type LSM, single stage, 235 g.p.m. @ 304′ head, direct connected to 25 hp, 220/440 v, 3 ph, 60 cy, totally enclosed fan cooled motor.

2—B-J, Type LSM, single stage, 435 g.p.m. @ 550′ head, direct connected to 75 hp, 220/440 v, 3 ph, 60 cy, totally enclosed fan cooled motor.

1—B-J, Type S, single stage, 1870 g.p.m. @ 327′ head, direct connected to Elliott turbine 104 hp, 275# inlet steam pressure, 40# exhaust, non-condensing.

2—B-J, Type S, single stage, 2200 g.p.m. @ 335′ head, direct connected to Elliott turbine, 129 hp, 275# inlet steam pressure, 40# exhaust, non-condensing.

2—B-J, Type SM, single stage, 290 g.p.m. @ 515′ head, direct connected to 60 hp, 220/440 v, 33 ph, 60 cy, totally enclosed, fan cooled motor.

2—B-J, Type SM, single stage, 125 g.p.m. @ 520′ head, direct connected to 50 hp, 220/440 v, 3 ph, 60 cy, totally enclosed, fan cooled motor.

1—B-J, hydropress, Type 12L-8, 8 stage, 50 g.p.m. @ 1100′ head, direct connected to Coppus 19 hp, 275# inlet steam, 40# exhaust, non-condensing turbine.

1—B-J, Type H-SM, single stage, 120 g.p.m. @ 540′ head, direct connected to Elliott turbine, 40 hp, 275# inlet steam, 40# exhaust, non-condensing.

1—B-J, Type H-SM, single stage, 50 g.p.m. @ 388′ head, direct connected to 20 hp, 220/440 v, 3 ph, 60 cy, explosion proof, fan cooled motor.

2—B-J, Type L-SM, single stage, vertical split type, 70 g.p.m. @ 310′ head, direct connected to 20 hp, 220/440 v, 3 ph, 60 cy, explosion proof, fan cooled motor.

2—B-J, Type SM, single stage, 162 g.p.m. @ 100′ head, direct connected to 10 hp, 220/440 v, 3 ph, 60 cy, explosion proof, fan cooled motor.

1—Amsco Nagle, Type SW, vertical sump pump, 50 g.p.m. @ 58′ head, direct connected to 3 hp, 220/440 v, 3 ph, 60 cy. motor.

1—I-R, Type 2½ NT, horizontal split case, 4 stage, 300 g.p.m. @ 325′ head, direct connected to 100 hp, 440 v, 3 ph, 60 cy, totally enclosed, fan cooled motor.

2—I-R, type 1½ CRVH, single stage, vertical split, 75 g.p.m. @ 139′ head, one direct connected to 1½ hp, 440 v, 3 ph, 60 cy, totally enclosed, fan cooled motor and one to Elliott turbine 5 hp, type 2AY, 275# inlet steam, 5# exhaust.

1—I-R, single stage, 100 g.p.m. direct connected to 10 hp explosion proof, 220/440 v, 3 ph, 60 cy. motor.

2—I-R, sump pumps, type #25, direct connected to multivane air-motor.

1—I-R, Type #2 MRV-1S, 2 stage, 100 g.p.m. @ 125# P.S.I. head, direct connected to 15 hp, 220/440 v, 3 ph, 60 cy, explosion proof, fan cooled motor.

1—B-J, Type H-SM, single stage, 500 g.p.m. @ 304′ head, direct connected to 60 hp, 3 ph, 60 cy, 220/440 v, motor.

1—I-R, type #5-ALU, horizontal split case, single stage, double section, 1000 g.p.m. @ 125′ head, direct connected to 30 hp, 220/440 v, 3 ph, 60 cy, totally enclosed, fan cooled motor.

2—Barton-American, fire pumps, 600 g.p.m. @ 120 P.S.I., driven by Ford V-8 engine mounted on rubber tired trailer.

2—I-R sump pumps, single stage, 200 g.p.m. @ 10′ head, direct connected to multivane air-motor.

2—United Iron Works, Type SAB, single stage, 570 g.p.m. @ discharge pressure and direct connected to 30 hp, 220/440 v, 3 hp, 60 cy, totally enclosed, fan cooled motor and one to Elliott turbine 30 hp, type 2AY, 275# inlet steam, 45# exhaust.

2—B-J, type VC, 2 stage, 440 g.p.m. @ 840′ head, direct connected to Elliott turbine, 87 hp, type 2AY, 275# inlet steam, 45# exhaust.

2—B-J, type H-SM, single stage, 98 g.p.m. @ 230′ head, direct connected to 10 hp, 220/440 v, 3 ph, 60 cy, explosion proof, fan cooled motor.

1—B-J, type 12L-8, hydropress, 8 stage, 50 g.p.m. @ 1100′ head, direct connected to 25 hp, 220/440 v, 3 ph, 60 cy, totally enclosed, fan cooled motor.

2—B-J, type L-SM, single stage, 270 g.p.m. @ 366′, one direct connected to 7½ hp, 220/440 v, 3 ph, 60 cy, explosion proof motor and one to Elliott turbine, type 2AY, 28 hp, 275# inlet steam, 45# exhaust, non-condensing.

1—Amsco-Nagle, single stage, vertical shaft, type SW, 55 g.p.m. @ 20′ head, direct connected to 1½ hp, 220/440 v, 3 ph, 60 cy, motor.

1—I-R, type #5ALV, horizontal split case, single stage, double suction, 1000 g.p.m. @ 125′ head direct connected to 30 hp, 220/440 v, 3 ph, 60 cy totally enclosed, fan cooled motor.

2—B-J, type 41"S", horizontal split case, single stage, 500 g.p.m. @ 175′ head—no drive on one, one direct connected to Coppus turbine, 7½ hp, 275# inlet steam, 45# exhaust.

### RECIPROCATING PUMPS

1—National Transit, 8x4x12, simplex, Ace piston type.

2—Union Steam Pump, 8x6x8, simplex.

2—Union Steam Pumps, 6x3½x6 duplex, piston type.

1—Union Steam Pump, 6x4x6 duplex, piston type.

### MISCELLANEOUS PUMPS

1—Watson-Stillman, hydraulic, pressure testing pump, type 240A, fig. 8, 2000# /sq. inch, manual, ¾" connections.

1—Deming, hydraulic, single action, model #594, 400# /sq. inch, ¾" connections.

2—Schutte-Koerting, steam jet, vacuum pump, single stage, size 3.

1—Hills-McCanna, proportionating, type HB 2¼", fig. C-70, plunger type, stainless steel, cast steel body, 2.3 g.p.m. max. capacity, single stroke, ratchet drive with Boston type TB-40 geared speed reducer, driven by 2 hp, 440 v, 3 ph, 60 cy, explosion proof, fan cooled motor.

1—Hills-McCanna, type LM-10, single stage, 29.2 g.p.m., ratchet drive, H-M speed reducer drive, ½ hp, 110 v, 60 cy, single phase, explosion proof motor.

2—Schutte-Koerting steam jet vacuum pumps, size 1½", type S, single stage, 1¼" connections.

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**DISMANTLING COMPLETE REFINERY**

**Towers and Vessels • Heat Exchangers and Condensers • Laboratory Equipment**

**Warehouse Stocks, etc.**

***Write—Wire—Phone for Complete Listings***

**DULIEN STEEL PRODUCTS, INC**
*of Washington*
P. O. BOX 667
COTTON VALLEY, LA.
PHONE: COTTON VALLEY 26

## EQUIPMENT FOR SALE

FOR SALE: Wilson Giant draw works, powered by two JL-1335 Buda engines with Wilson chain compound. Unit completely overhauled. Can sell separate or with a complete rig. For information, call or write Melton Supply Company, Box 1360, Seminole, Oklahoma.

**WAR SURPLUS MACHINERY**

Gaso, Byron Jackson, Aurora, Wayne, Lombard & Hale Fire Pumps with Engines, 1½ to 25 KW Generator Sets or Light Plants, Engines, Suction Hose, Fire Hose, Victaulic Couplings & Etc. Write for listing. H. A. McCarthy, 310 Thompson Bldg., Phone 5-3296, Tulsa, Oklahoma.

ONE 24-L Bucyrus-Erie Drill with 49′ derrick, derrick hoist, cat heads, and swabbing gear. Price $6000.00. Would sell complete with tools. CLAYPOOL DRILLING COMPANY, St. Elmo, Illinois.

FOR SALE: Cardwell RL spudder, complete with 5″ tools, mast, light plant, steel tool house. Low down payment. Barnes Drilling Company, 22 West 4th, Tulsa, Oklahoma.

USED Franks Model SA-4500 Rotary Rig with 96 ft. derrick, rotary table, and Cummins engines. Excellent condition. Write Box D-574, The Oil and Gas Journal, Tulsa, Oklahoma.

SPUDDERS: Good used equipment. Fort Worth Models Super H. and C. Wichita 55. Wilson rotaries. Franks and Longyear machines. New and used tools and supplies. Fishing tools rented. Everything for well drilling. Pressey & Son, Pueblo, Colorado.

FOR SALE—94′ Lee C. Moore Jackknife derrick. Folding type base 5′ 4″ high, 30′ long, 10′ cellar span and Portable Rig Model R-810-6 draw works, 35 x 8″ water cooled brakes, automatic and spinning line catheads powered by two 145 GKU Waukesha engines, butane and gas equipped. Price $17,500.000. Falco Drilling Co., Alice, Texas.

**FOR SALE**

**Nickel Cadmium Alkaline Batteries, for diesel engine starting, marine service or seismograph work. Twelve-four cell in wooden cases 16″ high, 26½″ long, 12″ wide. Type D.K.M. 48. Amp. hours 280 Charge 56 amps for seven hours. Never been used, can be had at large discount.**

**OILFIELD SALVAGE CO., INC.**
**2019 Brooks St., P.O. Box 2589, Houston, Texas**

**TWO COMPLETE STRINGS OF ROTARY DRILLING TOOLS**

One with U 34 Unit draw works; 6 cyl. GMC Diesel engine; 7¼ x 10 Type A Emsco triple X power pump. The other with P-150-46 Emsco draw works; R 61 Climax engine; 7¼ x 12 FXZ Gardner Denver pump with P-225 Climax engine. Both have 3,000 ft. drill pipe and all necessary tools and equipment. Also 16,000 ft. new and used casing; 10,000 ft. new and used tubing.

**PAUL DORAN ESTATE**
**Fehren Bldg., Vandalia, Illinois. Tel. 460**

**FOR SALE**

1—Model UE-60 Allis-Chalmers Swabbing Unit Mounted on 6 x 6 x 2½ ton GMC G.I. Truck, with 6-cylinder GM Gasoline Engine and 7 x 6 x 50 Single Leg Telescoping Pole with 2-18 inch Roller Bearing Sheaves—Engine on Unit Completely Reconditioned.

1—Model 5060 Ideco Skid-Mounted Well Servicing Unit with 525 Buda Engine, Equipped with Electric Starting System and 7741 Brown Lipe Transmission — Engine Completely Reconditioned.

3—Model EKHU Waukesha Gas-Butane Engines.

1—Model VIK Waukesha Gas - Butane Engine.

**Write or Call**

**Empire Machinery Company, Ltd.**
**Box 4026—Phone LD-18**
**Odessa, Texas**

## EQUIPMENT FOR SALE

FOR SALE: One Gumbo Buster 26″ Oil Bath rotary table in good running condition. Attractive price. Melton Supply Company, Box 1360, Semniole, Oklahoma.

FOR SALE: One combination houseboat and boathouse. Built on steel barge 85 ft. long x 28 ft. wide x 9 ft. deep. One end constructed with wings similar to a floating drydock with cradle to accommodate a 42 ft. cruiser. An installed pump will pump the barge down, allowing the cruiser to be floated into place. The barge is then pumped up and the cruiser stored dry. Entire barge is covered with roof and sides and boat end is closed with overhead door. Opposite end houses very fine quarters, lounge, galley and washroom and an awning covered sun deck. Ideal for the sportsman or oil operation in inland waters. To our knowledge the only vessel of its kind in existence. Can be inspected by appointment at Rockport, Texas. Write Gulfport Shipbuilding & Drydock Corporation, Port Arthur, Texas, or call 2-6486.

FOR SALE: One, type-100 National Drilling Rig has drilled only two wells. With 800,000 pounds capacity jack-knife derrick. Box D-448, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE OR LEASE—Fully equipped 4500 Star Cable Drilling Rig. A real bargain. Write or see Dr. K. E. Little, 3829 Troost Avenue, Kansas City 3, Missouri.

CATERPILLAR ENGINE Model D-13000; Gaso pumps 1742, 10″ stroke, unit skid mounted and in operating condition. Indiana-Illinois area. Sohio Pipe Line Co., 407 No. 8th Street, St. Louis, Mo., Attn: Mr. H. F. Fisher.

**FOR SALE: One 7¼ x 14 Whelan model 11000 Slush pump. New fluid end, gear box A-1. Melton Supply Company, Box 1360, Seminole, Oklahoma.**

**FOR SALE**

1—125 H.P. 350# Working Pressure "Oil Well Boiler," excellent condition. Completely reconditioned. Not used since last approved by State Boiler Inspector. Priced to sell. Make an offer.

**POWELL BRISCOE, INC.**
**1916 First National Building**
**Oklahoma City, Oklahoma**

## EQUIPMENT FOR SALE

**USED ROTARY AND CABLE TOOL DRILLING TOOLS, WIRE LINES. E. A. KELLY, BOX 861, OKLAHOMA CITY. PHONE 5-6407.**

**BARGAIN**

4—100 HP Superior Twin Gas Engine COMPRESSORS—now operating in Oklahoma. Alfred B. Kern, 223 Wright Bldg., Tulsa, Oklahoma.

CORE Drill Equipment for Sale: Two "Franks" truck mounted core drills, 2,000′ capacity; one shop built truck mounted core drill, 1,600′ capacity. All mounted on KR-11 International trucks. Four KB-7 International oil field trucks with jin poles and model 34 Tulsa winches. Four pole trailers with bolsters, three of them equipped with dollies for holding pipe loads. Approximately 2,500′ used 3½″ x 20′ drill pipe with 3⅜″ tool joints. Contact Mr. K. J. Reid or Mr. W. H. Hawkes, P.O. Box 1654, Oklahoma City. Telephone 2-6381.

**41 ALLISON ENGINES**
**$395.00 Each**

V-1710-49 and V-1710-53 12 cyl. Allison engines. 100 HP. No time since overhaul. Less nose gear. Can be converted to natural gas.

**GROBAN SUPPLY COMPANY**
**1507 S. Michigan Ave., Chicago, Illinois**

**SPECIAL OFFERING**
**GAS, GATHERING OR FLOW LINES**

50,000′ 5⅜″ and 5½″ OD X .180/.200″ Wall 9.5# Average SEAMLESS ROLLER CUT BEVELED END TUBES at $59.50 Cft., FOB St. Louis, Mo.

This material has been exceptionally well cleaned and for all practical purposes, can be considered good as new. Inspection or samples arranged for on request.

40,000′ 12¾″ OD X .250″ Wall NEW ELECTRIC WELD 33.37# Beveled Ends 40′ Lengths.

**Available for Immediate Delivery, Subject to Prior Sale.**

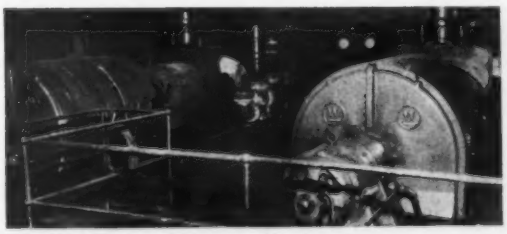
**OTHER SIZES LINE PIPE AND TUBING AVAILABLE. FOR PRICES CONTACT**

**A. J. STRUBEL**
**4946 Murdoch, Sidney 1791, St. Louis, Mo.**

***We Specialize in***

**PROCESS STEAM PRODUCING TURBINE GENERATORS**

**OUR JULY SPECIAL: 2-MODERN HIGH GRADE MACHINES**
**BULLETIN 405 ILLUSTRATES DESCRIBES THEM**
**SEND FOR IT TODAY**



**Above cut covers 2-2000-K.W., 250/300#-psig., 40#-B.P., 2300-v., Westinghouse Non-condensing Turbines. A recent rigid Inspection shows less than 5% wear. You save 65% under Mfrs. today's price on identical units: Are modern, Complete with all Accessories. Full load water rate 26.0-KWHr. Many Other Non-condensing units in our Stock — also, condensing turbine, diesel power, boilers.**

***Correspondence Invited***

**CHARLES WEAVER**

**Wire or Telephone Our Expense 4146 Penobscot Bldg., Detroit, Mich.**
**Telephones: WO.1340, WO.1341, WO.1-6038**



XUM

## EQUIPMENT WANTED

INTERESTED in 4' late model radial drill with or without electric motor. Must be A-1 condition, standard make.
NATIONAL COOPERATIVE REFINERY ASSOCIATION
PURCHASING DEPARTMENT,
McPHERSON, KANSAS

## HELP WANTED

WANTED: Refinery combination machinist pump and engine mechanic. Must be thoroughly experienced. Maximum age 40 years. Box D-554, The Oil and Gas Journal, Tulsa, Oklahoma.

STRUCTURAL designer C.E. graduate major in structural design with 3 to 5 years experience in design of steel and reinforced concrete structures, experience in structural design in oil refineries or chemical industry desired. (Address) Box D-583, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men. Salaried positions—$3600 to $30,000. This confidential service for outstanding men who desire a change of connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

WANTED: SEISMOGRAPH PARTY CHIEFS—For field work in Alberta, Canada. Single or married men, no children, preferred. Minimum two years party chief experience required with university geological or geophysical background. Salary open based on experience and general ability. Excellent opportunity for men willing follow field work. Box D-531, The Oil and Gas Journal, Tulsa. Oklahoma.

**Engineer Wanted**

Large Company with expansion program has an immediate opening for a Petroleum Engineer experienced in production, drilling, and well completion operations in the Louisiana Gulf Coast area. Experienced with inland water operations is desirable. Rapid promotion is proposed as employee assumes responsibility. Salary will be commensurate with applicant's qualifications. All applications will be handled confidentially.

Write Box D-568
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

**WANTED**

**FOR CHEMICAL PLANT**

**Located in South**

**ESTIMATORS**

Must be experienced engineers, under 40, familiar with Refinery and Chemical Plant design and capable of estimating process equipment installations from flow diagrams and specifications. Give full information, experience record and salary expected.

**DRAFTSMEN-DESIGNERS**

Preferably with ME, CE, or EE degree, under 40, with at least three years drafting experience in Chemical or Oil Industry. Give full information, experience record and salary expected.

BOX D-530
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

## HELP WANTED

CONTROLLER
Integrated Oklahoma oil company wishes to employ experienced, aggressive accountant under 45 years of age. Should possess initiative, ability to handle personnel, and experience in installation and operation of general accounting system and cost controls. Excellent future. Salary commensurate with qualifications. All replies confidential. Address Box D-550, The Oil and Gas Journal, Tulsa, Oklahoma.

ESTABLISHED Seismograph Company has opening for Party Chief. Two years minimum experience in charge of party and college degree in science or engineering required. This job offers adequate salary and profit sharing plan. Reply Box D-563, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Cable tool drillers and tool dressers on Bucyrus-Erie Spudder Machines, drilling water wells. Steady work. JOS. EGERER, Well Drilling Contractor, 1012 North Third Street, Milwaukee 3, Wisconsin.

FOREIGN and Domestic Oil Employment Directory covering the oil industry, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla.

WANTED—Geophysicist with geological background by independent oil company to review, interpret seismic data. Must have knowledge of instruments and techniques. Permanently located in Houston. State age, training, experience and expected salary. Address Box D-549, The Oil and Gas Journal, Tulsa, Oklahoma.

**SALES ENGINEERS**
**OPERATIONS SUPERVISORS**
**PERFORATOR OPERATORS**

Only Experienced Men Need Apply.

WRITE ONLY

**WELEX JET SERVICES, INC.**
**3900 Hemphill Street, Fort Worth 9, Tex.**

**REPRESENTATIVE WANTED**

Aggressive manufacturer's representative needed for Houston and Gulf Coast territory for sale of complete line of Oil and Gas Separators and related specialties for production, refining, and chemical industries. Firms having engineering graduate salesmen and no control accounts given preference. Replies should include number and background of sales personnel, territory actively covered, present active accounts. No supply houses or engineering companies need apply. Replies will be held confidential.

Box D-539
The Oil and Gas Journal
Tulsa, Oklahoma

## WANTED

WANTED: Settled sand production. Send details first letter. Reply P. O. Box 2161, Cincinnati 1, Ohio.

WANTED TO BUY: Small producing oil wells in Kansas. Box D-585, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Someone to lease and drill a block of 10,000 acres near 1,000-barrel well in Nemaha County. H. T. Harper, Vermillion, Kansas.

WANTED: SURPLUS Chemicals, Oils, Waxes, Solvents, Wastes and Residues of all kinds. Chemical Service Corporation, 98-06 Beaver St., New York 5, N. Y.

## SITUATIONS WANTED

ACCOUNTANT-AUDITOR. Public accounting background. Now employed as assistant controller-office manager of independent refinery in Chicago area. Will relocate. Box D-578, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED drilling, completion, and production man desires connection with independent producer or company as superintendent or assistant superintendent in Oklahoma or Kansas. Thoroughly familiar with secondary recovery methods and problems. Box D-576, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL WELL Equipment Manufacturers needing sales representative in Bradford, Titusville, Pa., and Bolivar, N. Y., Fields contact Bradford, Pa., man with intimate knowledge of producers and Supply Companies. Finest References. Reply Box D-582, The Oil and Gas Journal, Tulsa, Oklahoma.

**REFINERY SUPERINTENDENT**
Experienced and competent. Excellent record and references. Box D-556, The Oil and Gas Journal, Tulsa, Okla.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131, Ph. No. 131, Hobbs, New Mexico.

FIFTEEN years experience in pipe-line operations, gaging, tank strapping, etc., and general movement crude oil. Can furnish references. Am 43, sober and single. Salary commensurate with regional pay. Available immediately. Reply Box D-575, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE ENGINEER, Age 32, ten years experience, terminating five years foreign pipe line projects. Desires return to U.S.A. Completely experienced in all phases pipe line, station and terminal design and construction. Will consider work in expanding natural gas industry. Available for interview August 1. D-557, The Oil and Gas Journal, Tulsa, Oklahoma.

MECHANICAL ENGINEER, 30, 1 year sales, 7 years engineering experience. Desire to relocate permanently in East Texas with independent contractor or producer. Will invest some capital. Presently employed, four years office and field work in drilling and production with major. Reply Box D-564, The Oil and Gas Journal, Tulsa, Oklahoma.

SOBER, dependable production or drilling superintendent desires permanent connection with progressive independent operator. Available on short notice. Reply Box D-573, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE Oklahoma University, 3 years geological experience major company, desires geological, land, or scouting connection with independent. Address Box D-572, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE geological engineer-petroleum engineer, age 39. Experience: geophysics, reservoir engineering, sample analysis, electric well logging, valuation reports, geological reports, well completions. 15 years experience Rocky Mountain, Mid-Continent, and West Texas. Desires connection with responsible company. Reply Box D-569, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED IN EAST TEXAS field, preferably near Kilgore or Overton, work supervising and producing lease or number of leases. Will do all flowing or pumping on per-well or percentage basis. Can furnish own manpower and car. If interested, contact Box D-546, The Oil and Gas Journal, Tulsa, Oklahoma.

DESIRES CHANGE: Trained in supervision operation crude distillation, Thermal and catalytic cracking, alkylation, polymerization, stabilizers, Blending, treating, testing—industrial management. Any reasonable offer. Box D-526, The Oil and Gas Journal, Tulsa, Oklahoma.

## LEASES AND RENTALS

FOR lease or rent 3030 square feet attractive office space in Frates Building, Odessa, Texas. Modern, air-conditioned and parking space. On lease basis, will arrange floor space to suit tenant. C. L. Frates, 1101 First National Building, Phone 2-6301, Oklahoma City, Oklahoma.

### LEASE AND DRILLING BLOCKS

**OFFERING 30,000 acres leases Valencia County, N. Mex., 10,000 Hidalgo County, 6,000 Torrance County, $1.50 acre—17,000 acres Wallace County, Kansas, $1. Write if interested, Box 2183, Denver, Colo.**

HAVE proven location for shallow oil. Need few investors with $100.00 to join in drilling. Quick action. Box D-535, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Oil and Gas Leases and Drilling propositions in Shallow territory of Allen, Simpson, and Warren Counties, Kentucky, W. P. Harley, Bowling Green, Kentucky.

OFFERING 32000 10 yr. oil and gas fee leases at $1.25 per acre in Western Nebraska County where oil play is hot right now. Box 2181, Denver, Colo.

FOR SALE: 87-acre, new 10-year lease, in the heart of activity, Shelby County, Texas. $5 per acre. C. A. Parker, Office Polley Hotel, Center, Texas.

IF you've got real oil proposition or royalty that you wish to sell, or any defaulted municipal or special assessment bonds, bring your deal to me. Dyer-OJ, 1835 Champa, Denver, Colorado.

FOUR producing oil wells, seventy barrels production. Viola lime. Three separate leases. New equipment 4100' deep. Salt water disposal wells connected. HARPER WELL SERVICE, 1121 Union National Bank Bldg., Phone 4-2121, Wichita, Kansas.

MONTANA leases for sale. Carter Oil drilling good test on Big Poplar Structure in NE Montana. Also Murphy Oil to drill Devonian test on same structure. I have 7500 acres in scattered blocks on the same structure. Will consider selling 1% override also. A. C. Hornung, Consulting Geologist, 1241 Howard, Billings, Mont. Ph. 9-1502.

MISSISSIPPI
North-Central GUSHERS. North-eastern shallow. Will block your favorite spot 5,000 to 10,000 acres. 25 wells drilling this year. Bank references and quick action. Leases your bank with draft attached. Blocking, buying, drilling Arkansas, Louisiana, Tennessee, Kentucky. Gilt-edge organization. OIL, 1369 Court. Memphis, Tenn.

**LEASES ROYALTIES**

**Producing and Nonproducing**
**Bought and Sold—Any Area**
**Inquiries Invited**

**B. D. BUCKLEY**
**6376 Clayton Road, St. Louis 17, Mo.**

**ALBERTA LEASES**

**Put your name on our list to receive offerings of Oil and Gas Leases in the hot areas of Alberta.**

**Maps and Plats furnished.**
**ALBERTA LEASEHOLDS**
**Dept. 7**
**131 9th Ave. West, Calgary, Alberta.**

**Choice North and South Dakota perpetual minerals, under company leases paying yearly rentals. Minerals $2.50 per acre, leases 0.50 per acre, carrying 0.10 rentals.**

**A. W. ELLIS G. W. CARROLL**
**Grand Pacific Hotel,**
**Bismarck, North Dakota**

### LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa, 3, Oklahoma.

### PRODUCTION WANTED

WE ARE INTERESTED in purchasing marginal or semi-marginal production in Permian Basin for Cash or terms. Please send complete details to Box D-543, The Oil and Gas Journal, Tulsa, Oklahoma.

### ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

**ELK CITY POOL—(Oklahoma)**
Royalties at bargain. A. S. Berry, owner, 522 Wright Building, Tulsa, Oklahoma. Phone 5-5402. Investors with capital solicited.

WANTED: Oklahoma, Texas, Louisiana, New Mexico and Kansas Producing Oil Royalties. 3 to 5 year pay out required. Cash. No waiting. Submit your price and Pipe Line runs. Large or small acreage. Whitchurch Supply House, Box 584, Ardmore, Oklahoma.

**MONTANA ROYALTIES**
Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1225, Great Falls, Montana.

FOR ROYALTIES in Coke, Runnels and Tom Green Counties, Texas, Contact: Joe Carter, Box 371, Phone 166 or 68, Bronte, Texas.

### BUSINESS OPPORTUNITIES

**WANT about $5,000 for small refinery deal in Montana. Abnormal returns from investment. Details — Box 2181, Denver, Colo.**

RESPONSIBLE man with sales and executive background will invest approximately $7500 in oil well supplies company or a similar business dealing with Kansas oil industry. Box No. D-581,, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Well equipped Oil Field Machine Shop consisting of Hollow Spindle Lathe, 3 Engine Lathes, Boring Mill, Portable Welding Equipment, Bucking Machine, Gauges and everything for a complete Oil Field Machine Shop. This shop could not be replaced for $100,000.00. Doing $10,000.00 to $13,000.00 per month. Asking price $50,000.00. Box D-584, The Oil and Gas Journal, Tulsa, Oklahoma.

### MANUFACTURERS REPRESENTATIVE

WANTED: Representatives selling pumping equipment in South Texas, Louisiana, and Mississippi desiring additional items. State experience. Box D-580, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Manufacturers' representative for established line of oil well pumping equipment and specialties for the states of Colorado, Wyoming, Montana, and Western Canada. Give experience and list of present manufacturers represented. Write Box D-579, The Oil and Gas Journal, Tulsa, Oklahoma.

SMALL but aggressive company established for many years in California desires major line of oil field equipment to supplement single major line now represented. Will consider manufacturers' representative arrangement or dealership. Box D-567, The Oil and Gas Journal, Tulsa, Oklahoma.

### FOR SALE—MAPS

**NEVADA OIL AND GAS LEASE MAPS**

Complete and up-to-date lease maps of the state. Filing service. Daily and weekly filing information. Geologic advice.

**UNITED ENGINEERS**
**409 Cheney St., Reno, Nev.—Phone 4535**

### WAREHOUSE SPACE

**WAREHOUSE SPACE WANTED**
Eastern manufacturer of oil well production equipment interested in warehouse in Southern Illinois.

Will consider establishing joint warehouse with associated but non-competitive company.

**Box D-565, The Oil and Gas Journal, Tulsa, Oklahoma**

### PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorney, Suite 418, 815-15th Street, N.W., W..shington 5, D. C.

# EQUIPMENT MEN

*(Continued from page 114)*

## Tagliabue Appoints New Sales Representatives

Tagliabue Instruments Division of Weston Electrical Instrument Corp. has announced the appointment of the following Weston district sales representatives who are now, in addition, handling the Tag line:

C. L. Huffman, Russell F. Clark Co., Pittsburgh; C. W. Stafford, C. B. Fall Co., St. Louis; E. F. Schimbor, Herman E. Held, San Francisco; R. C. Staub, Beedle Equipment Co., Cincinnati; G. O. Miller, Schiefer Electric Co., Inc., Syracuse; T. J. Cunerty, Powerlite Devices, Ltd., Toronto; A. R. Hough Co., Knoxville; Edward S. Sievers, Los Angeles; T. S. Cawthorne Co., Detroit; Eicher & Co., Seattle; Ward Engineering Co., Inc., Orlando and Jacksonville; W. J. Keller, New Orleans; and W. H. Dittman, Cowperthwait & Brodhead, Boston.

In the Colorado territory, Peterson Co. of Denver handles sales of chemical and industrial thermometers, hydrometers, and moisture meters; while Burson Sales, Inc., also of Denver, handles Celectray pyrometers and the mechanical line of Tag temperature and pressure indicating, recording, and controlling instruments, and dial indicating thermometers.

## American Cyanamid Shows Catalysts at Open House

Demonstration of Fluid Cracking of Petroleum in making Fuel Oil and Gasoline
American Cyanamid produces about half of the catalyst used for this purpose
CATALYSTS ARE OF GREAT INDUSTRIAL IMPORTANCE

***Cracking catalysts and their importance to the petroleum industry were displayed by American Cyanamid Co. during an open house held at the company's Stamford Research Laboratories. Sample bottles showing the physical form of the many catalysts used were also exhibited.***



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# CALENDAR

**July**

Pacific Coast Gas Association, annual convention, Seattle, Wash., July 31-August 3.

**August**

Interstate Oil Compact Commission, summer meeting, French Lick, Ind., August 3-5.

**September**

National Chemical Exposition, Chicago Coliseum, Chicago, September 5-9.

American Institute of Chemical Engineers, regional meeting, Minneapolis, September 10-13.

American Society of Mechanical Engineers, and Instrument Society of America, Municipal Auditorium, Buffalo, N. Y., September 11-15.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 13-15.

Instrument Society of America, annual instrument conference and exhibit, Municipal Auditorium, Buffalo, N. Y., September 18-22.

American Society of Mechanical Engineers, petroleum mechanical engineering conference, Roosevelt Hotel, New Orleans, September 24-28.

**October**

American Gas Association, annual convention, Atlantic City, N. J., October 2-6.

Mid-Continent Oil and Gas Association, Texas division, Dallas, October 4-5.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, Mid-Continent meeting, Roosevelt Hotel, New Orleans, October 4-6.

American Association of Oilwell Drilling Contractors, annual meeting, Mayo Hotel, Tulsa, October 9-10.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, West Coast meeting, Elks Club, Los Angeles, October 12-13.

Permian Basin Oil Show, Odessa, Tex., October 19-22.

Independent Natural Gas Association of America, annual meeting, Shamrock Hotel, Houston, October 23.

**November**

Mid-Continent Oil and Gas Association, Louisiana-Arkansas Division, annual meeting, Roosevelt Hotel, New Orleans, November 2-3.

American Petroleum Institute, annual meeting, Biltmore and Ambassador Hotels, Los Angeles, November 13-16.

American Society of Mechanical Engineers, Hotel Statler, New York, November 26-December 1.

**December**

American Institute of Chemical Engineers, annual meeting, Columbus, Ohio, December 3-6.

**NOMADS**

**Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.**

**Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.**

**Houston Nomads, second Monday of each month. Ye Ole College Inn, Houston.**

**Los Angeles Nomads, second Wednesday of each month. Jonathan Club.**

## Permian Basin

(Continued from page 108)

Howard County: Stanolind Oil & Gas Co. 1 Louis Hutto, 1,160 ft. from S, 660 ft. from E lines, 4-31-1S-T&P, 2½ mi. SW Coahoma, TD 9,347 ft., PB 7,500 ft., elev. 2,373 ft., Wolfcamp, perf. 240 shots 7,370-7,430 ft., pumped 27 bbl. of 35°-gravity oil a day, GOR 287 cu. ft., Sprayberry 5,160 ft., Pennsylvania 8,215 ft., Mississippian 8,845 ft., Ellenburger 9,305 ft.

Runnels County: O. W. Killam and Frank Pethybridge 1 J. P. Knight (formerly J. S. Gambel), Sec. 346, BBB&C Sur., 7 mi. SE Winters, 1½ mi. W McMillan field, TD 4,376 ft., PB 4,033 ft., elev. 1,706 ft., Strawn pay 3,958-68 ft., flowed 4,830,000 cu. ft. of gas daily, 34/64-in. choke, CP 945 psi., TP 625 psi., completed natural and shut in.

**WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES**

Crockett County: Greenbrier Oil Co. and Spartan Drilling Co. 1 H. W. B. Montgomery, SW SW 5-J-GS&SF, 10 mi. S Ozona, dry, TD 10,190 ft., elev. 2,459 ft., Strawn 9,068 ft., Fusselman 9,349 ft., Ellenburger 9,758 ft.

Moore Exploration Co. 4-C H. M. Halff est., 69-1-I&GN, dry, TD 298 ft. in sand.

Garza County: O'Neal Drilling Co. 1-A P. G. Spinning, 15-5-GH&H, 7½ mi. SE Post, dry, TD 3,320 ft., elev. 2,376 ft., lime 2,145 ft.

Hockley County: Big Chief Drilling Co. 1 DeLoache, NW NW Labor 22, Lge. 77, Reeves CSL, 9½ mi. NW Levelland, dry, TD 11,452 ft. in pre-Cambrian, elev. 3,632 ft., San Andres 3,712 ft., Glorietta 5,070 ft., Tubb 6,350 ft., upper Clear Fork 5,940 ft., lower Clear Fork 6,440 ft., Pennsylvania 8,590 ft., Ellenburger 10,-820 ft., granite wash 11,435 ft.

Howard County: Geo. P. Livermore, Inc. et al 1 W. B. Hardy, NE SE 33-31-2N-T&P, 7 mi. S Barnsdall 1 Wilson discovery, 7 mi. SE Vealmoor field, dry, TD 8,388 ft., elev. 2,518 ft., anhydrite 1,060 ft., Yates 1,590 ft., San Andres 2,680 ft., Sprayberry 5,540 ft., reef 8,308 ft.

Kent County: Spartan Drilling Co. et al 1 E. E. Wallace estate, NW NW SE 97-G-W&NW, 12 mi. W. Clairemont, dry, TD 7,865 ft., elev. 2,343 ft., Ellenburger 7,838 ft.

King County: Nelson Bunker Hunt 1 W. R. Ross, NE SE 52-A-R. M. Thompson Sur., 14 mi. E Guthrie, dry, TD 6,618 ft., elev. 1,620 ft., lime 5,280 ft., Ellenburger 6,570 ft.

Shamrock Oil & Gas Co. 1 Masterson, SE NE 29-A-R. M. Thompson Sur., 11 mi. NE Guthrie, dry, TD 6,200 ft., Palo Pinto 4,900 ft., Cisco 3,280 ft.

Mitchell County: T. W. Doswell 1-A G. N. Soloman, NW NW 72-97-H&TC, 3 mi. SE Standard of Texas 1 Dunn discovery, dry, TD 8,311 ft., PB 7,504 ft., elev. 2,229 ft., reef 7,455 ft., Ellenburger 8,233 ft.

Pecos County: Hunt Oil Co. 21 Elsimore Royalty Co., 26-B-GC&SF, 4½ mi. SE Chancellor, dry, TD 1,610 ft.

A. R. McElreath & Travis B. Dean 1 Iowa Realty Trust, 125-10-H&GN, 4½ mi. NW Oswego, dry, TD 4,090 ft., elev. 2,431 ft., Yates 884 ft., Ellenburger 4,005 ft.

Runnels County: Simon Lebow, T. W. Murray and E. A. Poe 1 John McNeil, 807-H. T. Sapp Sur., 8 mi. W Winters, dry, TD 4,785 ft., elev. 1,969 ft., Saddle Creek 2,745 ft., Swastika 3,100 ft., Home Creek 3,635 ft., Hardy sand 3,700 ft., Palo Pinto 3,965 ft., Capps 4,335 ft.

Sutton County: C. L. Norsworthy, Jr. 1 Barton Heirs, SE SW 105-B-HE&WT, 2½ mi. NW Sonora, dry, TD 7,944 ft., elev. 2,280 ft., Strawn 5,085 ft., Ellenburger 7,475 ft.

**SOUTHEAST NEW MEXICO WILDCAT FAILURES**

Lea County: Magnolia Petroleum Co. 1-H Walker-Federal, SW SW 6-9s-36e, NE stepout to Bough field, dry, TD 10,235 ft., elev. 4,136 ft., Yates 2,790 ft., San Andres 4,090 ft., Abo 7,740 ft., Pennsylvanian 9,105 ft.



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# It's no time to fiddle!

HEADLINES warn us of the menace of spies and subversive agents. But in every community there is a hazard, largely unrecognized, which may become ready tinder for the ravaging flames of socialism and communism. This is the misconception of everyday economic facts that exist among our young people.

For example, a recent poll among high school seniors shows that the majority of them believe that the owners of business take out for themselves a larger share of the income than is paid to employees. They think the stockholders' average return is 24% of the sales dollar. The truth is that stockholders average less than 3%, whereas over 30% of the income dollar is paid out as wages, pensions and other benefits.

Our young people do not seem to realize that paying dividends is only one function of profits. Far more important today is the need for profit to keep business competitive, and to pay for new buildings, machinery, and other necessary equipment and to provide new and more jobs. Ignorance of this fundamental concept breeds contempt for the system of enterprise that built our country and keeps it strong.

The facts of business must be given to our boys and girls to protect their future. Only business men can supply the facts. As a business leader in your community, it is your responsibility to help clear up such misconceptions. The old story that Nero fiddled while Rome burned must not have a counterpart in America.

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